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ABSTRACT

This numeracy package, which is intended for use by facilitators in group or tutoring situations, consists of materials designed to help adult literacy students understand number systems, appreciate the different roles that numbers play in daily life, and gain the confidence needed to work with numbers in everyday situations. Part 1, which establishes contexts for using numbers and explains number systems, includes sections dealing with recognizing numbers, counting and number values, calendars and dates, and time and clocks. In part 2, addition, subtraction, multiplication, and division are taught through a nontraditional spiral approach according to which all operations are introduced at a basic level, reintroduced at an intermediate level, and reintroduced a second time at a higher level of difficulty, all the while building on students' prior knowledge. Each section contains a title paper; a brief overview of the section, suggestions for working with the materials provided, and student handouts and exercises. (MN)

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ED 385 760

Numbers in our Lives

Betty Dondertman
Tom Ciancone

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Numeracy methods and materials

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Numbers in our Lives

Numeracy Methods and Materials

Betty Dondertman
Tom Ciancone

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Numeracy Methods and Materials

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About Numbers in our Lives

This numeracy package began as a response to the numeracy needs of many adult literacy students. Most adult math materials begin with whole number operations. It was clear to us from our own work with learners that there was a lot of ground to cover before we could begin to make use of these materials. We created this numeracy package to help fill the gap between literacy and math.

Our goals in developing this package were many. We started with the premise that the content must be relevant to the everyday lives of most learners. (We say "most" because we are aware that it is impossible to generalise about learners and their needs.) The materials are designed to foster an understanding of number systems, and an appreciation of the different roles numbers play in our lives. Since working with numbers can cause anxiety in many women and men, we wanted to convey the feeling that numbers are important, yet fun. The ultimate goal is to develop in learners the confidence with numbers that they will need to work with numbers in everyday situations. It is important to add that we do not expect an individual learner to work through the entire package. The span of the package is such that parts of it will meet the needs of many learners much of the time.

We endeavored to present all the basic mathematical concepts in a logical order using a coherent numeracy methodology that we developed. We felt that the value of being complete in regards to a methodology outweighed the demand for quantity of mathematical practice in the form of more exercises. Therefore, each concept is covered briefly. Exercises are available from other sources whereas an integrated literacy/numeracy methodology is not. The facilitator has the job of reinforcing students' understanding through tutoring and by providing materials for extra practice when necessary. It will help to refer to **Numeracy Books for Adult Learners**, a bibliography of numeracy and math materials also published by the Adult Basic Education Unit. Keep in mind that we see Numbers in our Lives playing an inspirational role: facilitators are encouraged to become familiar with it in order to get an overview of numeracy methodology. This package is a starting point.

Part One of this package, "Understanding Numbers", establishes contexts for the use of numbers and explains number systems. Apart from the four operations, numbers are used for identification purposes, for dates, and for time. For this reason, a section on number recognition is included here, as are sections on the number systems used in calendars and clocks and a section on counting and number values.

Part Two, "Working with Numbers", involves what we normally think of as traditional *mathematical learning but we have used a non-traditional, circular approach. The operations are introduced in a spiral fashion: all the operations first at a basic level, then at an intermediate level, and again at a higher level of difficulty, all the while building on prior knowledge. Each section in Part Two deals with a set of skills. Adding and subtracting are dealt with together, as are multiplying and dividing. In each section, new skills for the paired operations are introduced. The last section in Part Two deals with all four operations and again, new skills are introduced. This approach allows learners to see the connection between the operations and it also acknowledges that adults may be familiar with certain concepts, like dividing, even though they may not be familiar with others, like subtracting with borrowing. Throughout the book, each section includes notes at the back of its title page that give an overview of the section along with suggestions for working with the materials.*

This package is designed to be used by facilitators in a group or tutoring situation; it is not a self-teaching or independent study package. Many concepts are very difficult to present in print in a form that can be grasped easily. That is why we say that facilitator support is essential. We chose a loose leaf format so that facilitators can pick and choose pages suitable for individual learners and so that they can add other materials if they wish to. Numbers in our Lives was designed for English-speaking literacy learners. The language used in this package is often colloquial, as it was not designed for ESL and ESL/literacy audiences. Even so, during the field-testing of the initial draft of this package both ESL/literacy and literacy classes used the materials. Certain parts of the package may be useful in ESL/literacy classes, but facilitators must use their discretion.

It must be said that, even after close to two years of work, we can still see room for improvement and additions. We encourage all users of this package to offer their feedback for future editions by writing to us at the Adult Basic Education Unit. Thank you in advance for your interest!

Betty Dondertman
Tom Ciancone
May 1991

PART ONE

Understanding Numbers

Part One is about numbers - where numbers are used and how numbers are used.

Numbers show up in many places and numbers are used in many different ways.

Recognizing Numbers

CANADA
EMPLOYMENT
CENTRE

Notes for Recognizing Numbers

- *This section is for people who want to talk about how numbers are used. It is for people who have trouble reading and writing numbers.*

- *This section includes the following.*
    - *writing numbers*
    - *reading numbers in everyday situations*
    - *talking about numbers and how they are used*

- *While there are many illustrations in this section that are helpful for talking about numbers, the facilitator and learners should use real objects in the classroom (telephone, health cards, etc.) whenever possible.*

- *This section assumes that the learners have seen numbers before. If the learners have no familiarity with numbers at all, they will need to begin with pre-literacy concepts such as matching shapes and the drawing of shapes. A useful resource for this is* Numbers Start Here *(ALBSU).*

Using Numbers to Identify People and Things

We see numbers in lots of places. We see numbers on buildings, on papers and cards, on telephones, on streetcars, on radios, on car licence plates and many other places. Numbers such as addresses identify things. Numbers such as social insurance numbers identify people.

Here is a list of different kinds of numbers. Find examples of these numbers and talk about whether each number is helping to identify a person or a thing.

* page numbers

* credit card numbers

* bank account numbers

* police badge numbers

* car licence plate numbers

* driver's licence numbers

* catalogue order numbers

* lottery numbers

* serial numbers

* addresses

* social insurance numbers

* television channel numbers

* telephone numbers

Can you think of any more examples of where numbers are used to identify people or things?

Numbers

Around the world, there are many ways to write numbers. In Canada the first counting numbers look like this:

1 2 3 4 5 6 7 8 9

Numbers can look different, depending on who writes them and where the numbers are. Here are some examples of how these first counting numbers can look and where you might see them.

1 2 3 4 5 6 7 8 9	on digital clocks
1 2 3 4 5 6 7 8 9	on fancy papers
1 2 3 4 5 6 7 8 9	on posters or signs

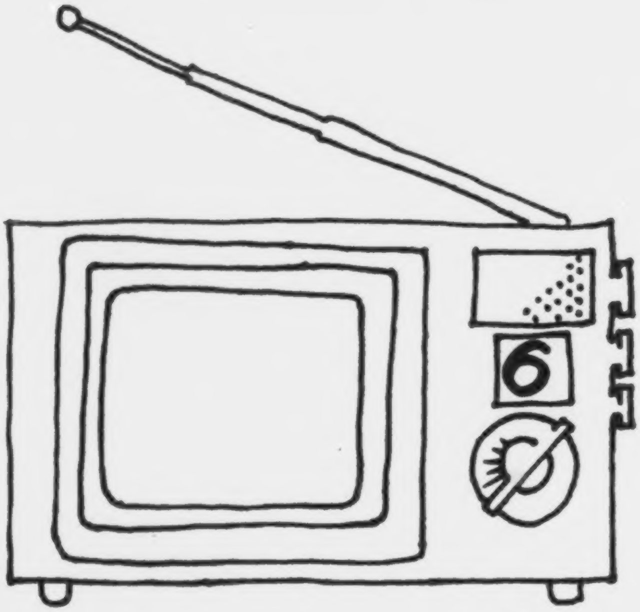
Practise writing the first nine numbers yourself.

Looking for Numbers

Look for the numbers in the following drawings.

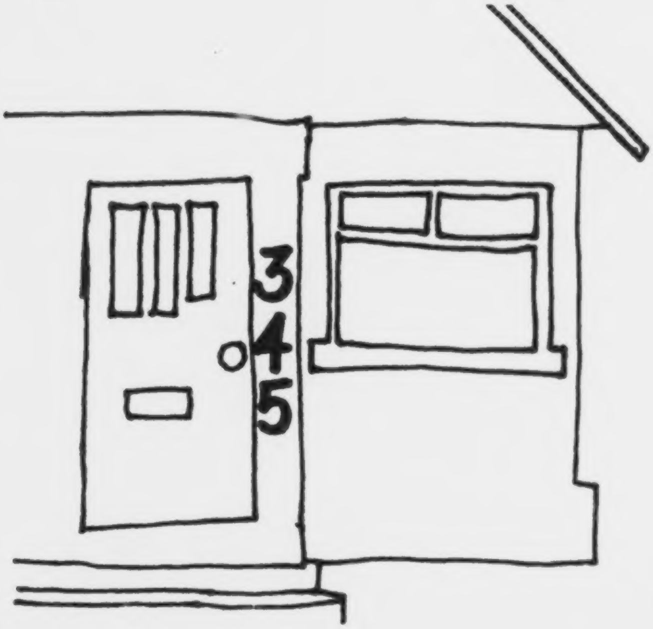
Television channels:

What station is on?



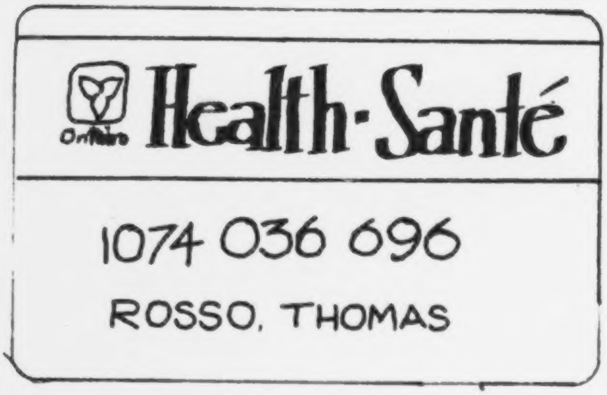
Addresses:

What is the number on this building?



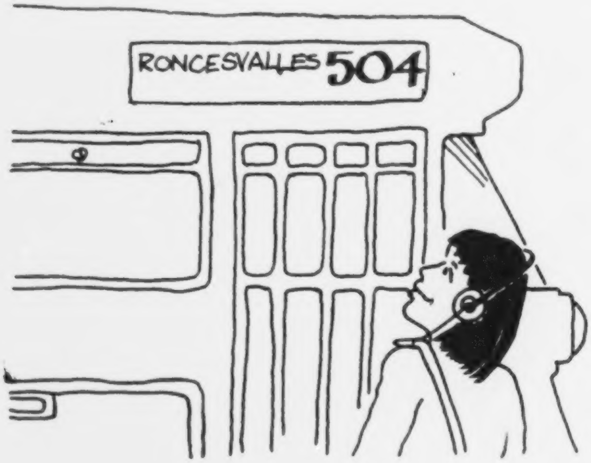
Health card numbers:

What is the number on this card?


Ontario
Health · Santé
1074 036 696
ROSSO, THOMAS

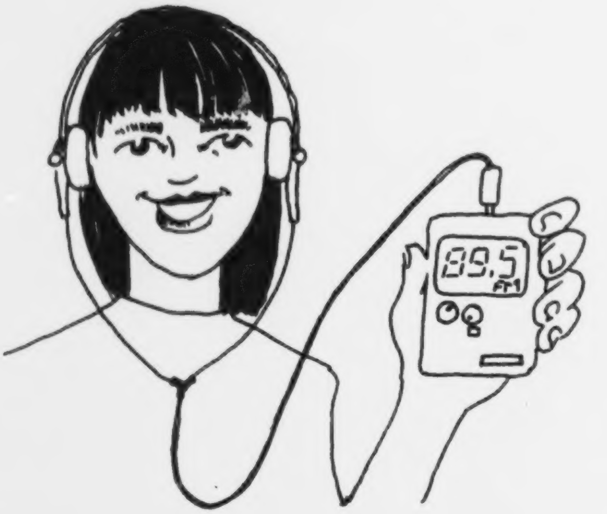
Streetcar routes:

What is this streetcar's number?


RONCESVALLES 504

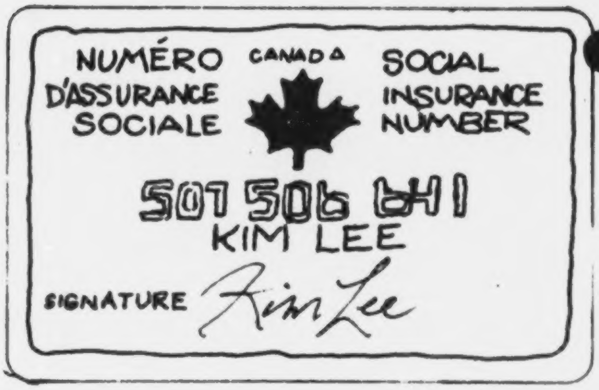
Radio stations:

Which station is she listening to?



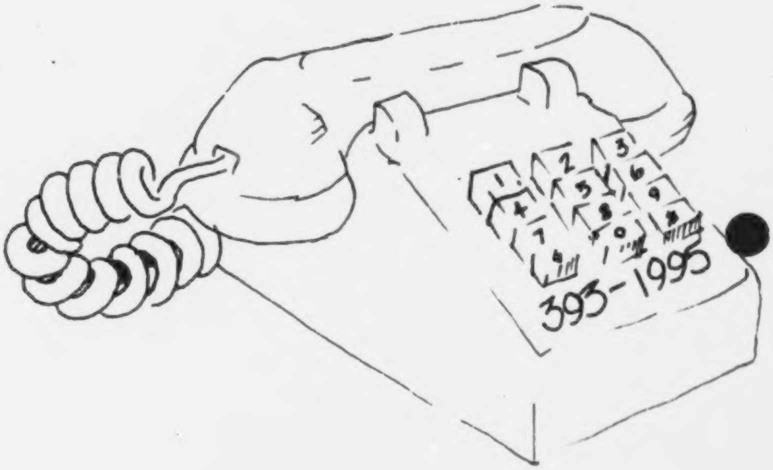
Social insurance numbers:

What is this person's social insurance number?


NUMÉRO D'ASSURANCE SOCIALE
CANADA
SOCIAL INSURANCE NUMBER
501 506 641
KIM LEE
SIGNATURE
Kim Lee

Telephone numbers:

What is the number on this telephone?


1
2
3
4
5
6
7
8
9
0
393-1995

Writing Numbers

Television channels:

Which channels does your T.V. get?
Write some of the channel numbers here.

Addresses:

Some addresses include a building number and an apartment number. Does yours?
Write your address here.

Health card numbers:

Look at the numbers on an Ontario health card.
Practise writing a health card number here.

Bus and streetcar route numbers:

Which bus or streetcar do you take regularly? What is the route number? Look for it on the front of the vehicle.

Radio stations:

Which radio station do you listen to the most? What is the station number? What is the number that you look for on the radio dial?

Social insurance numbers:

Look at a social insurance card. Practise writing a social insurance number here.

Telephone numbers:

Practise writing your telephone number and other telephone numbers that you often use.

You need to know area codes to make long distance calls. What is your area code?

What is the emergency number for the police, ambulance and fire department?

Look up your own phone number in the telephone book. Look up other phone numbers that you want to know.

Something to Talk About

What about our rights?

Who has the right to ask us for our social insurance number, or driver's licence number or any other identifying numbers that we have?

Who does not have this right?

To help you find the answers to these questions, you can contact the Ontario Human Rights Commission.

Counting and Number Values

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Notes for Counting and Number Values

- *This section is for people who have trouble counting or who do not understand the relative value of numbers.*

- *This section includes the following:*
    - *counting up to 1000*
    - *putting numbers in order*
    - *place value*
    - *estimating and rounding*
    - *reading and writing numbers written as words*
    - *counting by 2's, 5's, 10's*
    - *ordinal numbers*
    - *Roman numerals*

- *In learning to count, the use of tactile objects is essential. The learner and facilitator should use objects such as cups, pencils, pennies, and loonies. (Do not use other coins at this time.) A tape recorder with a "tape counter" is useful for showing how the number system works.*

- *The use of games makes counting a more enjoyable skill to learn. The facilitator is encouraged to use and make up games. Dominoes, dice, and playing cards are useful for this.*

- *For the discussion of place value, the facilitator should bring in some loonies, ten-dollar bills, and a hundred-dollar bill (or a hand-drawn facsimile).*

Understanding and Counting Numbers

How many people in the room want coffee?

Did you get the right change at the store?

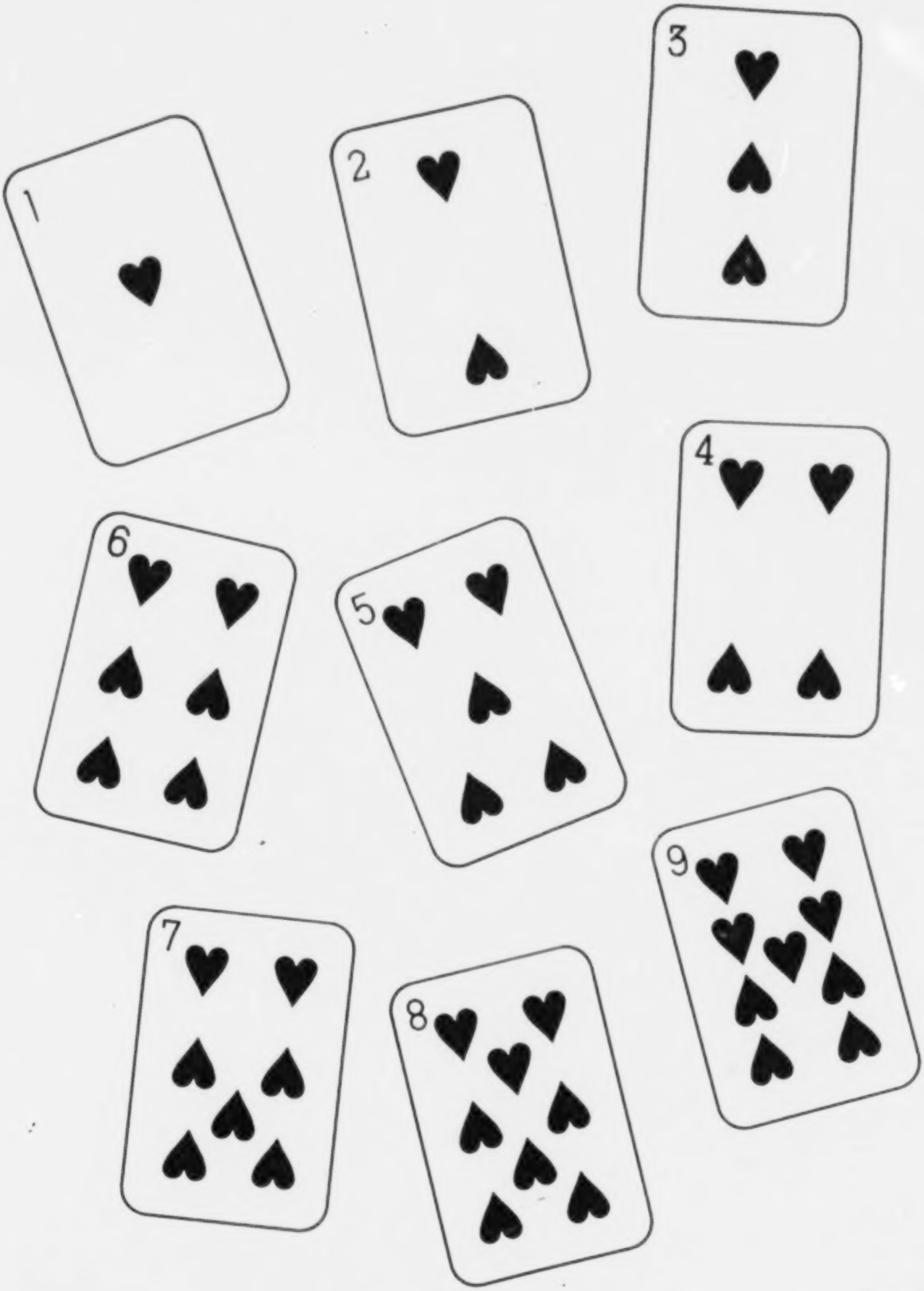
How many blocks is your house from the nearest bus or streetcar stop?

By how many votes did your member of parliament win the last election?

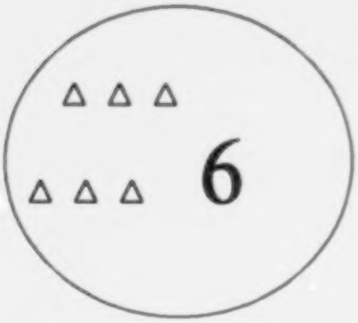
These questions are examples of important questions that you may want answers to. It is necessary to count in order to answer these questions.

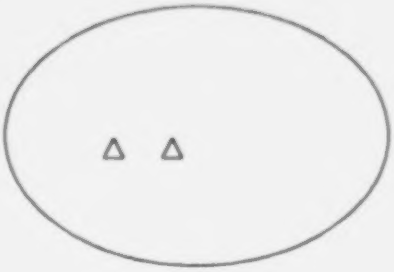
One way to learn about counting is by using a deck of cards. The next page shows 9 playing cards.

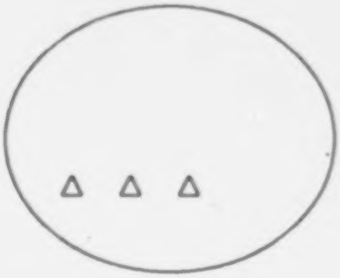
Count the hearts on each card. Notice that the number that you see on the card matches the number of hearts on the card.

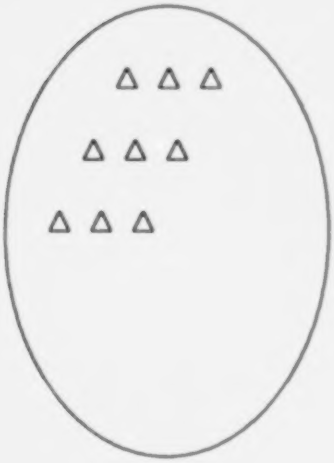

3
1
2
4
6
5
9
7
8

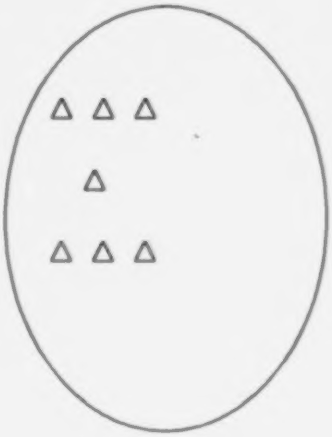
Count the triangles and then write the total number. Follow the example.

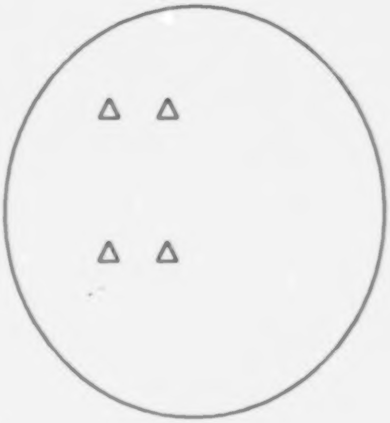


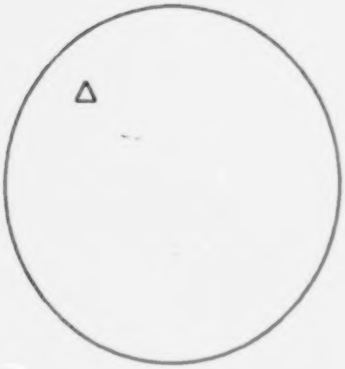


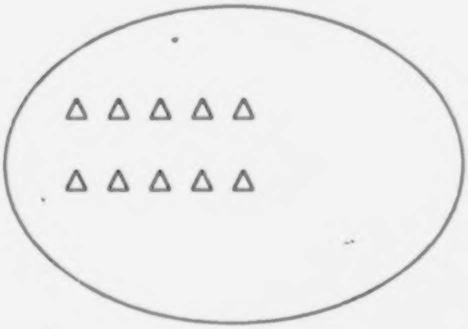


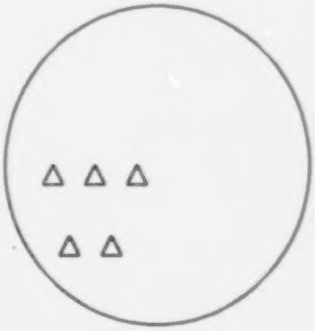












On this page are some groups of triangles. Read the number beside each group and then circle that number of triangles. Follow the example.

7 △ △ △ △ △
△ △ △ △ △

2 △ △ △ △ △
△ △ △ △ △

9 △ △ △ △ △
△ △ △ △ △

6 △ △ △ △ △
△ △ △ △ △

1 △ △ △ △ △
△ △ △ △ △

4 △ △ △ △ △
△ △ △ △ △

3 △ △ △ △ △
△ △ △ △ △

8 △ △ △ △ △
△ △ △ △ △

Draw as You Count!

Follow the example.

2 circles o o

5 triangles

4 squares

9 lines

3 squares

8 circles

Counting Past 9

You can see numbers being counted on the tape counter of a cassette recorder.

0	0	0

The starting point is always 0.

Follow these numbers down the page with your finger and watch the numbers getting larger, like they do on a tape counter.

1
2
3
4
5
6
7
8
9
10

Notice what happens! After 9, we start over with 10. The number after 9 has a 1 to the left of the 0.

Keep following the numbers. Watch as they get larger.

11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29

Notice the pattern. After 19, we start over with 20. The number after 19 has a 2 to the left of the O.

30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49

Can you explain why the number after 39 is 40?

Which number comes next?

50

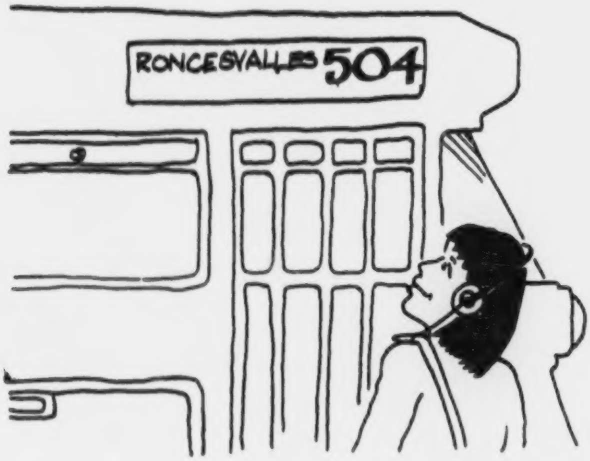
We will stop counting for now.

As we count, we keep using the same numbers again and again.

These numbers are:

1 2 3 4 5 6 7 8 9 0

Using these numbers in combination, we can write all the numbers that we need, just like we use the letters of the alphabet in combination to make words.



Read the numbers and then fill in the numbers that are missing. Follow the example.

1 2 3 4 5 6 7 8 9 10

11 12 ___ 14 15 ___ 17 18 ___ 20

___ 22 23 ___ 25 26 ___ 28 29 30

31 ___ 33 34 ___ 36 37 38 ___ 40

41 42 ___ 44 45 ___ 47 ___ 49 50

Putting Numbers in Order

These numbers are not in order. Write the numbers in order from smallest to largest. Follow the example.

9 12 8 10 11 13

8 9 10 11 12 13

42 44 39 41 43 40

23 20 24 21 22 19

Which Number is Biggest?

Circle the biggest number in each line. Follow the example.

17 18 [✓ 19] 16 15

46 44 45 43 42

12 11 10 13 9

28 30 29 27 31

Counting Backwards

When we count down from a larger number to a smaller number, we are counting backwards.

Fill in the missing numbers. Follow the example.

50 49 48 47 ____ 45 44 43 ____ 41

40 39 ____ 37 36 35 34 ____ 32 31

____ 29 28 27 26 ____ 24 23 22 21

20 19 18 ____ 16 15 14 13 12

10 ____ 8 7 6 5 ____ 3 2 1

Which Number is Smallest?

Circle the smallest number in each line. Follow the example.

15 16 14 [✓ 13] 17

45 43 44 41 42

20 19 18 16 17

30 31 32 29 33

How Many?

Answer the following questions. You may need to count.

How many people are in your learning group today?

How many tables are in the room?

How many chairs are in the room?

How many windows are in the room?

How many doors are in the room?

How many people live in your home?

How many sisters do you have?

How many brothers do you have?

How many children do you have?

Counting Past 50

Follow the numbers down the page with your finger and watch them getting larger like they do on a tape counter.

50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66

Notice the pattern.
After 59, start again with 60.
After 9, start with 0.
After 5, start with 6.

67

68

69

Can you explain why the number after 69 is 70?

70

71

72

73

74

75

76

77

78

79

Can you explain why the number after 79 is 80?

80

81

82

83

84

85

86

Which number comes next?

87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105

Can you explain why the number after 99 is 100?
After 9, start with 0.
After 99, start with 00.
There must be a number to the left of the zeroes.
Start with 1 next to 00.

We will stop counting now.

Review

Which number comes after 9?

Which number comes after 19?

Which number comes after 29?

Which number comes after 39?

Which number comes after 49?

Which number comes after 59?

Which number comes after 69?

Which number comes after 79?

Which number comes after 89?

Which number comes after 99?

Hundred Chart

Below are the numbers from 1 to 100 :

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

What is the next number?

after 99?

after 199?

after 299?

after 399?

after 499?

after 599?

after 699?

after 799?

after 899?

after 999? → 1000

Digits

We are going to look at some familiar numbers to notice how many digits they have.

The numbers from 0 to 9 have one digit.

The numbers from 10 to 99 have two digits.

The numbers from 100 to 999 have three digits.

Here are some one-digit numbers:
5, 8, 2, 9, 0

Here are some two-digit numbers:
10, 15, 33, 86, 99

Here are some three-digit numbers:
100, 459, 265, 999

Look at each number on this page and say how many digits there are.

25

3

12

67

950

4

18

365

550

32

7

414

8

229

30

1000

How many digits are in telephone numbers?

How many digits are in social insurance numbers?

Understanding Number Values

When numbers are written together, how do you know what each number means? We will use money to help show the value of each number.

When you have 3 loonies,
you have 3 dollars.

When you have 1 ten-dollar bill,
you have 10 dollars.

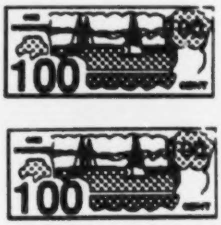
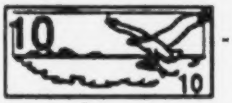
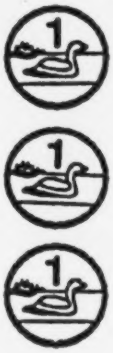
When you have 2 hundred-dollar bills,
you have 200 dollars.

213 means 2 hundreds and 1 ten and 3 ones.
We read this number, 213, as 2 hundred and 13.

On the next page, look at the money on the chart. Look for the ones (which are the loonies) the tens, and the hundreds.

Chart Showing $213

This sign – $ – means dollars.

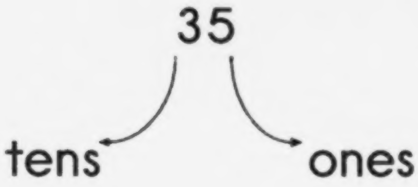
hundreds	tens	ones
		
2	1	3

This chart shows the value of each number.
On this chart, notice that:

the 2 is worth 200 dollars
the 1 is worth 10 dollars
the 3 is worth 3 dollars

Understanding Number Values

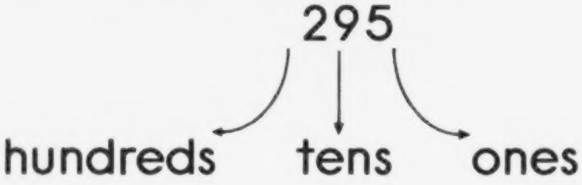
Notice the values of the 3 and the 5 in the number below:



In the number 35

- the 3 stands for 3 tens – that is 30
- the 5 stands for 5 ones – that is 5

Notice the values of the 2, the 9, and the 5 in the number below:



In the number 295

- the 2 stands for 2 hundreds – that is 200
- the 9 stands for 9 tens – that is 90
- the 5 stands for 5 ones – that is 5

Hundreds, Tens, and Ones

Read the dollar amounts. Say what the numbers mean. Follow the example.

$ 613 The 6 means 600.
The 1 means 10.
The 3 means 3.

$ 295 The 2 means
The 9 means
The 5 means

$ 470 The 4 means
The 7 means
The 0 means

$ 801 The 8 means
The 0 means
The 1 means

Comparing Numbers

You will see pairs of numbers on this page. Circle the bigger number in each pair. Follow the example.

1 or [✓ 10]

14 or 41

99 or 101

101 or 110

230 or 203

9 or 12

416 or 461

10 or 100

29 or 92

505 or 550

790 or 709

15 or 51

80 or 90

118 or 79

Reading About Numbers

The distance from Toronto to Hamilton is about 60 kilometres. The distance from Toronto to Montreal is about 500 kilometres.

Which is farther from Toronto, Hamilton or Montreal?

About 123 thousand people live in Thunder Bay. About 760 thousand people live in Ottawa.

Which city has more people, Thunder Bay or Ottawa?

A bottle of beer holds 340 mL of beer and a bottle of wine holds 750 mL of wine.

Which is smaller, the wine bottle or the beer bottle?

Which day is warmer, a day when the temperature is 24 degrees or a day when the temperature is 32 degrees?

Which address is farther up Yonge Street, 265 Yonge or 638 Yonge?

22
TWENTY-TWO

Different Kinds of Counting

You will see this pattern on addresses: the addresses on one side of a street are odd numbers, like this – 1, 3, 5, 7, 9, 11, 13, 15, and so on. The addresses on the other side of the street are even numbers, like this – 2, 4, 6, 8, 10, 12, 14, 16, and so on.

Sometimes, instead of counting every number, we skip numbers in a regular way. When we count by two's, we skip every other number.

Fill in the missing numbers in this group of even numbers.

2 4 6 8 10 __ 14 16 18 20 22 __ 26
28 __ 32 34 36 __ 40 42 44 __ 48 50

Fill in the missing numbers in this group of odd numbers.

1 3 5 7 __ 11 13 15 __ 19 21 __ 25 27
29 __ 33 35 37 __ 41 43 __ 47 49

Counting by Fives

You can see a pattern of counting by fives on clocks. The numbers around the outside of a clock mark off every five minutes of the hour. You can count the minutes by fives. When you count by fives, you count every fifth number, like this –

5 10 15 20 25 30 35 40 45 50

You can also practise this by counting five-dollar bills. Explanations of clock time is found in another section of this book.

This group of numbers shows counting by fives. Fill in the missing numbers.

5 10 15 ___ 25 30 ___ 40 45 ___ 55

60 ___ 70 75 ___ 85 ___ 95 100 105

110 115 ___ 125 130 ___ 140 145 150

Counting by Tens

We can also count by tens, like this –

10 20 30 40 50 60 70 80 90 100

You can practise this by counting out ten-dollar bills from a Monoply game or any game that uses fake money.

Fill in the numbers that are missing from this group.

10 20 30 ___ 50 60 70 ___ 90 100

110 ___ 130 140 ___ 160 ___ 180

190 200 ___ 220 230 ___ 250

Estimating

Sometimes we need to guess at a number because it is impossible to count. If we want to know how many people are in a crowd, we can estimate the total. If we are at a grocery store and only have a little money with us, we can estimate the total cost of our groceries before we go to the cashier. Estimating can be more important than exact calculation.

Estimating is like guessing, but it is more useful. Estimating is more accurate than guessing. We use our common sense and our experience to estimate.

Try estimating:

* the number of buttons on your shirt
* the number of pages in this book
* the number of books on the bookshelf
* the number of blocks to the subway station

If you are in a group, discuss and compare your estimates. Then find the answers by counting, to see how close you were.

Rounding

When we buy something and a friend asks what it cost, we usually give a rough answer. Instead of saying "92 dollars", we might say "about 90 dollars" or "almost 100 dollars".

Rounding is a short cut to help us estimate more quickly. Here is an example of how it works.

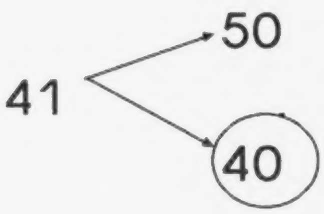
* 47 is between 40 and 50.
It is closer to 50. Round 47 up to 50.

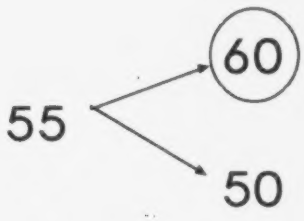
* 43 is also between 40 and 50.
It is closer to 40. Round 43 down to 40.

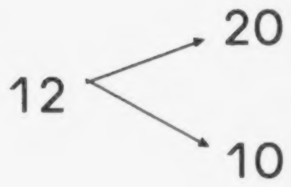
5 is halfway between 0 and 9.
When rounding, follow this rule:

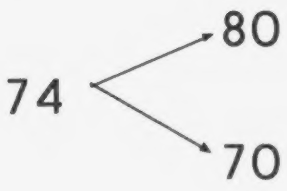
Below 5, round down; 5 and above, round up.

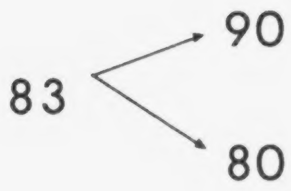
Practise rounding up or down to the nearest ten. Follow the examples.

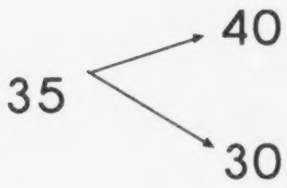


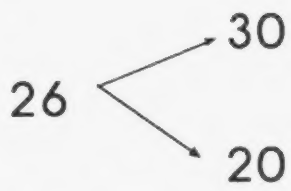


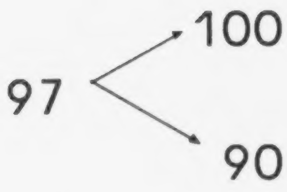












Spelling Numbers

Sometimes we need to read or write numbers as words. Do you notice where numbers are written as words? One place you see this is on cheques.

Below, each number is written as a word. Try reading the numbers as words.

0	zero	10	ten
1	one	11	eleven
2	two	12	twelve
3	three	13	thirteen
4	four	14	fourteen
5	five	15	fifteen
6	six	16	sixteen
7	seven	17	seventeen
8	eight	18	eighteen
9	nine	19	nineteen

Here are the spellings of some more numbers.

20	twenty

Starting with twenty-one, put a dash between the two parts of the number.

Look for the dashes in the following numbers.

21	twenty-one
22	twenty-two
23	twenty-three
24	twenty-four
25	twenty-five
26	twenty-six
27	twenty-seven
28	twenty-eight
29	twenty-nine

Here are the spellings of every tenth number from 30 to 100.

30	thirty
40	forty
50	fifty
60	sixty
70	seventy
80	eighty
90	ninety
100	one hundred

Write these numbers. Follow the examples.

35	thirty-five	72	seventy-two
63		99	
44		50	
18		21	

Some words in these sentences can be written as numbers. Find them and re-write them. Follow the example.

The C.N. tower is five hundred and fifty metres high. How many metres? ***550 metres***

There are about twenty-six million people in Canada.
How many million? ________ *million*

The average rent in Toronto is eight hundred and sixty dollars a month.
How much is the average rent? $________

This book has about two hundred and ninety pages.
How many pages?________

When you have twelve of something, you have a dozen.
How many are in a dozen?________

Ordinal Numbers

Sometimes we use a different way to say numbers when we count.

When we talk about the floors in a building, we say "the third floor" rather than "floor three." When we want to say where someone is in a line–up, we can say "She is the fourth person in line."

Here is a list of some ordinal numbers. Read through the list and compare the numbers with the words.

1st	first	6th	sixth
2nd	second	7th	seventh
3rd	third	8th	eighth
4th	fourth	9th	ninth
5th	fifth	10th	tenth
100th	hundredth	1000th	thousandth

Roman Numerals

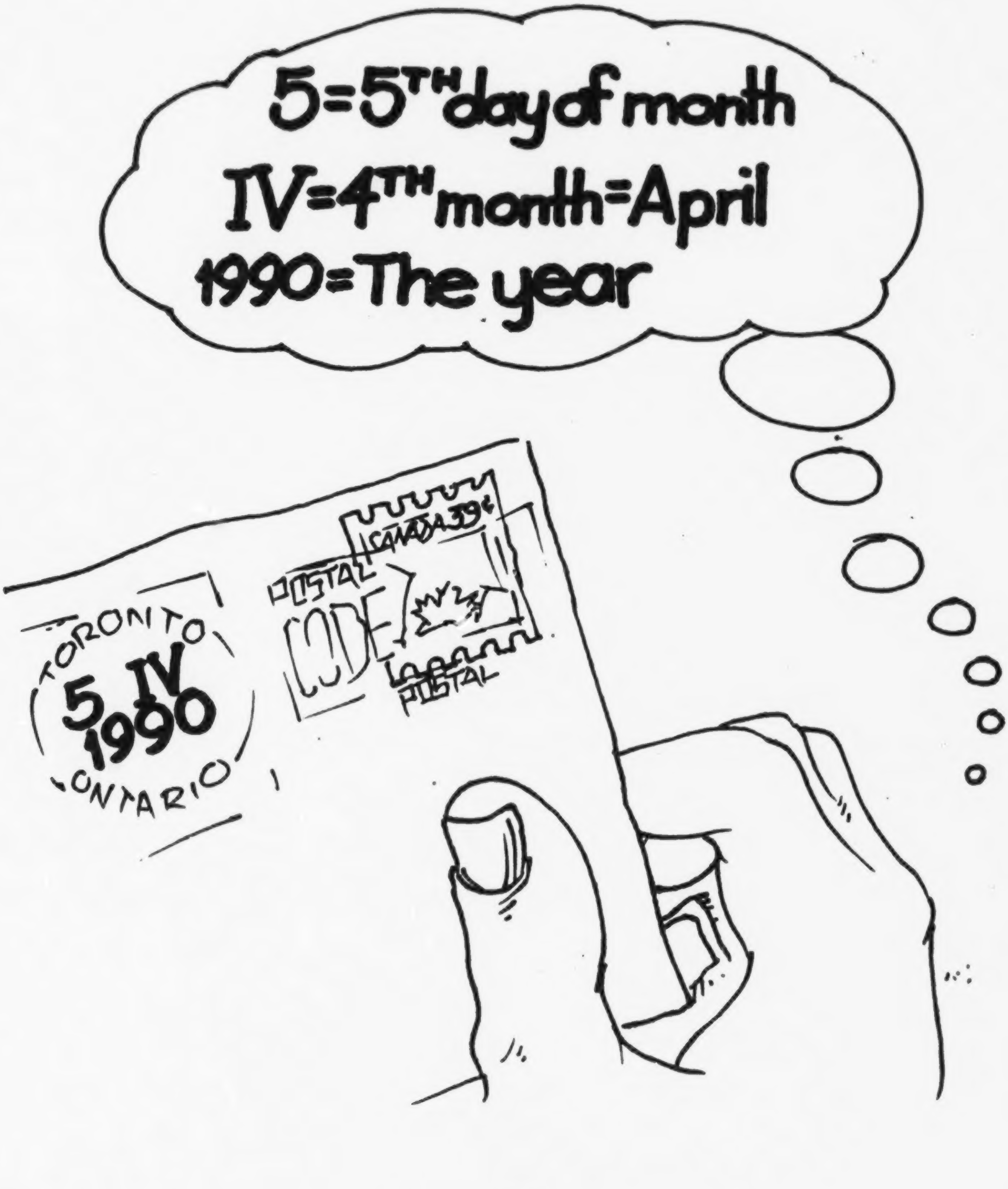
A different kind of number system from the one we usually use is called Roman numerals.

Roman numerals look like this:

I	1	VI	6
II	2	VII	7
III	3	VIII	8
IV	4	IX	9
V	5	X	10

This system was used two thousand years ago by the Romans who lived in Italy. They do not use this system today, but you will see these numbers in a few places. The date stamped on envelopes by the post office shows the month in Roman numerals. At the end of some movies, the year the movie was made is shown in Roman numerals.

Calendars and Dates


5=5TH day of month
IV=4TH month=April
1990=The year
TORONTO
5 IV
1990
ONTARIO
POSTAL
CODE
CANADA 39¢
POSTAL

Notes for Calendars and Dates

- *This section is for people who need help reading calendars or reading and writing dates.*

- *This section includes the following:*
    - *reading and interpreting calendars*
    - *reading and writing dates in numbers and words*

- *The activities in this section promote familiarity with calendars and dates; the learners and facilitator should make use of current calendars to discuss dates and events relevant to themselves.*

- *When written dates are ambiguous (1991/07/05), it can be pointed out that the system does sometimes break down in the absence of other clues.*

Reading Calendars

Calendars give us information about days, weeks, months, and years. Here are some things you need to know to help you read a calendar.

There are 7 days in a week. Here are the names of the 7 days: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday. You may find the names of the days across the top of a calendar or you may see their abbreviations. Sometimes you may see only these letters – S M T W T F S – which stand for the days.

For each name below, the abbreviation is circled. Look on a calendar to find how the days are written. Are there letters only, abbreviations, or full names?

Sunday Monday Tuesday

Wednesday Thursday

Friday Saturday

A One-Month Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

What day of the week is the 14th of the month?

What day of the week is the 1st of the month?

What day of the week is the 31st of the month?

What day of the week is the 5th of the month?

What day of the week is the 23rd of the month?

A One-Month Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

What is the date on the first Monday of the month?

What is the date on the second Friday of the month?

What is the date on the last Sunday of the month?

What is the date on the third Tuesday of the month?

What is the date on the first Sunday of the month?

About Months

There are 12 months in a year. The names of the 12 months are:

January, February, March, April,
May, June, July, August,
September, October, November, December.

Many months have 30 days. November is one month that always has 30 days. Many months have 31 days. December is one month that has 31 days.

Notice that February is different from all the other months. February usually has only 28 days, but once every 4 years, February has an extra day. That makes 29 days. When that happens, the year is called a leap year.

There is a calendar on the next page. Notice the 12 months, each month within a box. Notice the 7 letters inside each box that stand for the days.

A One-Year Calendar

January

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

February

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

March

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

April

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

May

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

June

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

July

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

August

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

September

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

October

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

November

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

December

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Look at the calendar on the previous page or bring one in. How many days are in each of the following months? Write in the number. Follow the example.

January	***31***
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

How many months are in a year?

Do you know these calendar facts?

How many days are in
- a week?
- most months?
- February?
- most years?
- a leap year?

About how many weeks are in
- a month?
- a year?

How many months are in
- a year?

Here are some calendar facts.

In a year, there are
- 365 or 366 days
- about 52 weeks
- 12 months

In a month, there are usually
- 30 or 31 days
- about 4 weeks

In a week, there are
- 7 days.

Calendar Dates

Some meetings are always on a certain day of the month, such as the first Tuesday of every month or the last Monday of every month.

On this year's calendar, find the dates for all monthly meetings that are on the first Wednesday of the month. Write the correct dates next to each month below.

January
February
March
April
May
June
July
August
September
October
November
December

Statutory Holidays in Ontario

Look at a calendar for this year. Try to find the dates for all these holidays. Follow the example.

Name of holiday	
New Year's Day	January 1
Good Friday	
Victoria Day	
Canada Day	
August Civic Holiday	
Labour Day	
Thanksgiving Day	
Christmas Day	
Boxing Day	

For most types of work, the law says that your employer must give you these days off with pay.

Other Special Days

In Canada, many holidays are Christian holidays. If you are not Christian, you probably celebrate different holidays.

Write down names of holidays that are important to you.

Name of holiday	When is it?

Do you know when these special days happen?

Yom Kippur
Chinese New Year
International Women's Day
Ramadan

Reading and Writing Dates

When we write dates, we can use numbers instead of words. We can use numbers for the year, numbers for the month, and numbers for the day. Here is an example:

1991 / 11 / 20
year month day

Notice the words - year, month, day - under the date. You may see the parts of the date - the year, the month, the day - written in a different order. You may see the date in this order : day, month, year. It is important to look for these words when you read or write the date.

The year and day are already in the form of numbers, but the month is not. By counting the months, each month gets a number.

Here are the names of the 12 months in order. Number them. Follow the example.

January 1
February
March
April
May
June
July
August
September
October
November
December

When you fill out a date on a form, you will see space for two digits for the month and for the day. If you are writing a one-digit number, put a zero to the left of it. This zero will be the extra digit. So, you will see and write 01 for January.

Write the name of the month beside its number. Follow the examples.

January	01	July	07
	02		08
	03		09
	04		10
	05		11
	06		12

Can you tell what the months are in these two dates?

91 / 04 / 25
y m d

92 / 09 / 30
y m d

Fill in the missing numbers in these dates.

November 3, 1991	1991 / 11 /
November 6, 1991	1991 / 11 /
November 19, 1991	1991 / 11 /
November 25, 1991	1991 / 11 /

March 25, 1991	1991 / / 25
September 25, 1991	1991 / / 25
August 25, 1991	1991 / / 25
January 25, 1991	1991 / / 25

Counting the Years

For a long time the first two numbers in the year have been 19 because this century is the nineteen hundreds. Soon we will come to the end of the nineteen hundreds. On New Year's Eve of December 31, 1999, the new year will be 2000.

Every January 1, we add a number to the year.

Next January, the year will be ?

What year came after 1989?

What year comes after 1995?

What year comes after 1999?

What year comes after 2000?

Remember that every 4 years is a leap year. The years 1980, 1984, and 1988 were leap years. When is the next leap year?

Looking for Information in Dates

Remember that the date includes three pieces of information: the day, the month, and the year. The information is not always in the same order.

Re-write the information from the dates on this page. Then say whether the date is in the past or in the future. Follow the example.

1978 / 04 / 25
The day is the *25th*
The month is *April*
The year is *1978*
This is in the *past.*

1960 / 11 / 20
The day is ______
The month is ___________
The year is ______
This is in the ___________

27 / 12 / 95
The day is _______
The month is ____________
The year is _______
This is in the ________

1987 / 05 / 22
The day is _______
The month is ___________
The year is _____
This is in the ___________

Writing Dates

Write today's date in the space below.

_____/_____/_____
year month day

Write your date of birth in the space below.

_____/_____/_____
year month day

Here are some different ways to write dates:

September 12, 1990

12 September 1990

Sept. 12, 1990

90 / 09 / 12

Write these dates in full. Follow the example.

85 / 02 / 03 → February 3, 1985

30 / 12 / 90

1991 / 09 / 15

08 / 05 / 95

Write today's date two different ways, using words and then numbers.

using words ______________________________

using numbers ______________

Write your birthday two different ways, using words and then numbers.

using words ______________________________

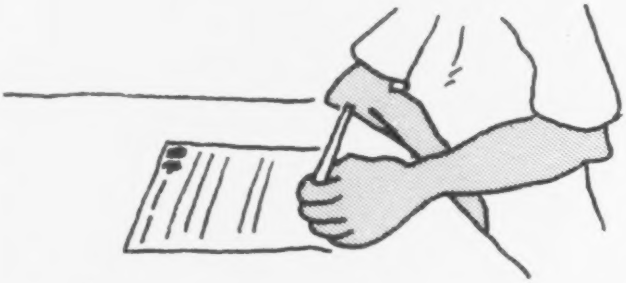
using numbers ______________

Looking for Dates

Many groceries have expiry dates stamped on them. Look for expiry dates on bread and other baked goods, yoghurt, and cereal. It usually says **best before** on the package and then gives a date. Notice the abbreviations that are used for the months. Some abbreviations have only two letters for the month, such as **SE** for September or **JL** for July.

Some bills have a discount date on them. It means that you pay less if you pay the bill before that date. Look for the discount date on hydro bills and on gas bills.

Are there other places where dates are important?



Time and Clocks

RING!
AAAH
7:00

Notes for Time and Clocks

- *This section is for people who need help understanding the concept of time, as well as the units of minutes, hours, and days.*

- *This section includes the following.*
    - *reading clocks*
    - *the digital time system*
    - *a.m. and p.m.*
    - *the 24-hour clock*

- *This section focuses mainly on the digital time system. If a learner needs an introduction to the analogue (face) clock, the facilitator should spend the time necessary to reinforce that knowledge.*

- *The facilitator should make use of various types of clocks. For example, practise setting the alarm on a digital alarm clock.*

- *Make up dialogues that have to do with appointments and schedules.*

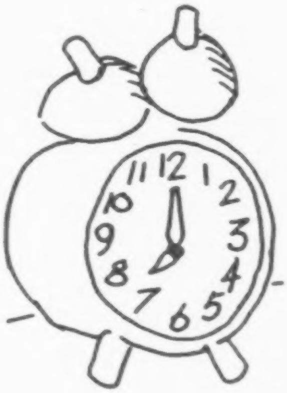
- *Make use of bus and train schedules, school course schedules, movie time schedules, etc.*

- *For extra practice in learning to tell the time, see the series A New Start-Canada (Dominie Press).*

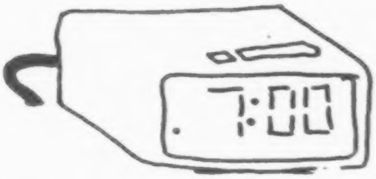
Clocks and Time

A day has 24 hours and one hour has 60 minutes. Clocks tell us the time. There are two kinds of clocks.

Clocks with hands look like this:



Clocks without hands look like this:

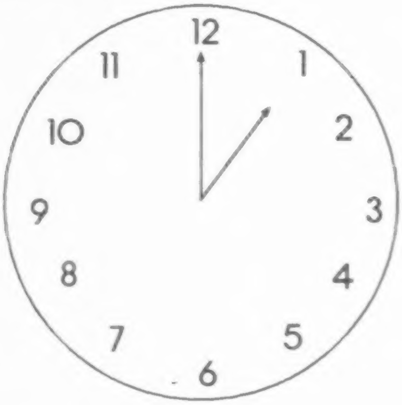


The clocks without hands are called digital clocks.

The time on these two clocks is the same.

Looking at Clocks

The hands of a clock go around the circle. One hand counts the hours and one hand counts the minutes. One hand is longer than the other. The shorter hand counts the hours and the longer hand counts the minutes.



Find the hand that counts the minutes and the hand that counts the hours.

The clock shows the numbers 1 to 12. It takes the short hand **1 hour** to move from one number to the next number. It takes the long hand **5 minutes** to move from one number to the next. So, the space between two numbers means 5 minutes for the long hand and 1 hour for the short hand.

Numbers on Clocks

There are 60 minutes in an hour. You can count the minutes around the clock face by 5's. Every time the minute hand passes a number on the clock, another 5 minutes have gone by. When the minute hand has gone around the clock once, 60 minutes have passed.

When you write the time, you separate the hour and the minutes with two dots, like this :

What time is it? It is 1:20.
It is one-twenty.
It is twenty minutes after one.

What time is it? It is 1:50.
It is one-fifty.
It is ten minutes to two.

Why is 1:50 the same as ten minutes to two?

Digital Clocks

There are 60 minutes in an hour. Every 60 minutes, the hour changes. Starting at one o'clock, here is what a digital clock shows:

at one o'clock → 1:00

one minute later → 1:01

ten minutes later → 1:10

thirty minutes later → 1:30

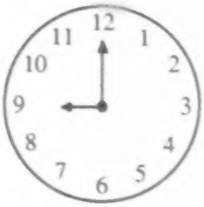
forty-five minutes later → 1:45

fifty-nine minutes later → 1:59

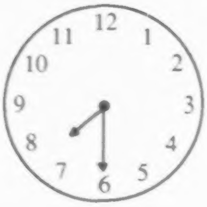
sixty minutes later,

it is two o'clock → 2:00

Write the time from these clocks the way a digital clock would show it. Follow the example.



9:00



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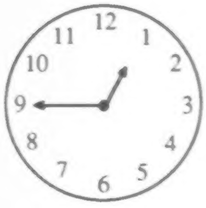

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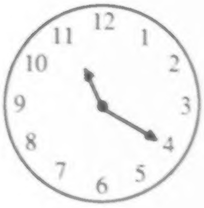

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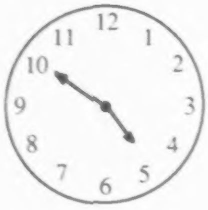

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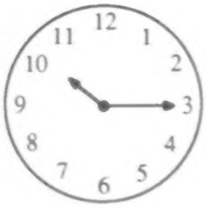

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Counting the Hours

There are 60 minutes in an hour. Every 60 minutes, the hour changes.

If it is 11:59, it is almost 12:00. In one minute, it will be 12:00.

What time is it?

It is 8:59. It is almost what time?

It is 5:59. It is almost what time?

It is 1:59. It is almost what time?

It is 12:59. It is almost what time?

It is 3:59. It is almost what time?

It is 7:59. It is almost what time?

It is 10:59. It is almost what time?

The Twelve-Hour Clock

Most clocks count the hours from 1 to 12.

After 12:00, the clock begins again at 1:00.
This is how a digital clock shows the time.

At twelve o'clock, a digital clock shows 12:00.

one hour later → 1:00

two hours later → 2:00

five hours later → 5:00

ten hours later → 10:00

twelve hours later → 12:00

thirteen hours later,

it is one o'clock again → 1:00

a.m. and p.m.

Because there are 24 hours in a day but only 12 hours on most clocks, the hour hand on the clock goes through the 12 hours twice in one day. The first 12 hours in the day are called a.m. time and the second 12 hours are called p.m. time.

The time from 12:00 midnight until 11:59 the next morning is a.m. time. The time from 12:00 noon until 11:59 at night is p.m. time.

Is it morning, afternoon, evening, or night? Look at the times and decide.

9 : 00 a.m.	Is it morning or evening?
5 : 45 p.m.	Is it morning or afternoon?
7 : 15 a.m.	Is it morning or evening?
11 : 59 p.m.	Is it nearly noon or nearly midnight?
12 : 00 a.m.	Is it midnight or noon?
12 : 00 p.m.	Is it midnight or noon?
3 : 20 a.m.	Is it the middle of the night or the middle of the afternoon?

The 24-Hour Clock

Airports, railways, long distance buses, and some hospitals use a 24-hour clock instead of a 12-hour clock. This way they avoid using a.m. and p.m. Look at a bus or train schedule and notice how the times are written.

In the 24-hour system, instead of counting the first 12 hours a.m. and the next 12 hours p.m., we count the hours in the day only once, from 1 to 24.

On a 24-hour clock, the first twelve hours are counted as usual from 1 to 12. So at noon the clock looks like this 12:00

After 12:00, instead of beginning again at 1:00, the clock continues by counting 13:00

The clock continues counting the hours until it gets to 24:00

Watch how p.m. times look on a 24-hour clock.

1:00 p.m. → 13:00

2:00 p.m. → 14:00

3:00 p.m. → 15:00

4:00 p.m. → 16:00

5:00 p.m. → 17:00

6:00 p.m. → 18:00

7:00 p.m. → 19:00

8:00 p.m. → 20:00

9:00 p.m. → 21:00

10:00 p.m. → 22:00

11:00 p.m. → 23:00

12:00 a.m. → 00:00 or 24:00

Read the 24-hour time and change it to a.m. / p.m. time. Follow the example

13 : 00 is 1 : 00 p.m.

18 : 00 is p.m.

20 : 00 is p.m.

16 : 00 is p.m.

21 : 00 is p.m.

14 : 00 is p.m.

23 : 00 is p.m.

19 : 00 is p.m.

15 : 00 is p.m.

24 : 00 is a.m.

PART TWO

Working with Numbers

Part Two is about the four operations:

adding +
subtracting -
multiplying x
dividing ÷

With these operations, you can solve problems and investigate questions that come up in your life.

Adding and Subtracting: A Beginning

Notes for Adding and Subtracting: A Beginning

- *This section is for people who are not familiar with adding and subtracting – the words, symbols, and concepts.*

- *This section includes the following:*
    - *reading and writing addition and subtraction statements with the signs +, −, =*
    - *understanding how and when to add and subtract*
    - *practice with patterns of adding and subtracting numbers up to 10*
    - *considering problems involving addition and subtraction at this level*

- *Concrete objects must be used when learning to add and subtract. Make use of any available objects, such as cups, pencils, pennies, and loonies.*

- *The relationship between adding and subtracting as opposite operations is emphasized. The facilitator should encourage learners to make this connection in concrete ways.*

- *The facilitator should also encourage as much discussion and practice as the learner needs to feel confident with these operations and the vocabulary.*

- *The facilitator should use other resources for extra practice when necessary.*

When do We Need to Add?

Consider this problem. If you are making tea and coffee for a group, you may want to know how many cups to get out of the cupboard. To find this out, you can count the people one by one. Another way to find out is to add. When we add, we are counting quickly in our heads. You can add the number of people who want coffee and the number of people who want tea. When you add these two numbers together, you know the total number of cups that you need.

If you are in a group now, try to find out how many cups you will need if everyone wants coffee or tea. Try adding the number of people who want coffee together with the number of people who want tea to get a total.

Can you add these numbers? If you are not sure, continue with this section to find out more about addition.

Think of other examples of using addition in your life. Talk about these examples.

Signs and Words

You find out that 2 people want coffee, and 3 people want tea. To get a total, you add these two numbers. You can write an addition problem with the numbers on top of each other, like this:

$$\begin{array}{r} 2 \\ +\ 3 \\ \hline 5 \end{array}$$

This problem shows
two plus three is five.

This sign + is the plus sign.
When you see a plus sign, you add.

You can also write the addition problem with the numbers beside each other, like this:

$$2 + 3 = 5$$

This problem also shows
two plus three is five.

This sign = is the equals sign.
When you see an equals sign, the solution or answer to the problem comes next.

These are the two ways to write an addition problem. No matter how you write the problem, the solution is the same. There is more than one way to write an addition problem and there is more than one way to talk about an addition problem.

When you see + you can say **add**, **plus** or **and**.

When you see = you can say **equals** or **is.**

Here are some ways to talk about this number sentence: 2 + 3 = 5

two and three is five

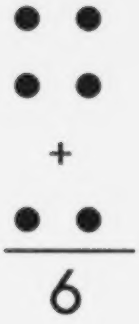
two plus three is five

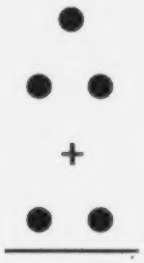
two plus three equals five

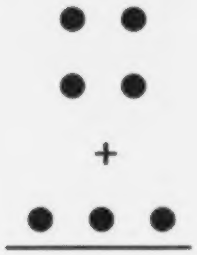
two add three is five

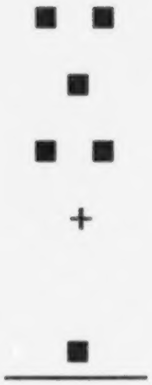
Are there any other words that you use when you add? No matter how you talk about it, the meaning of addition is the same.

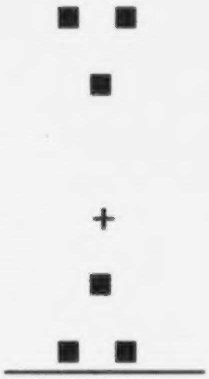
Add or count. Then fill in the solutions. Follow the example.

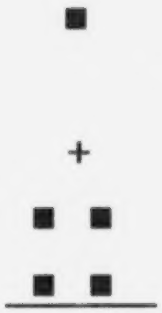




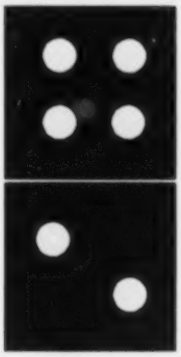




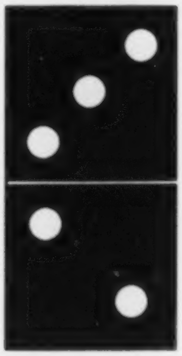


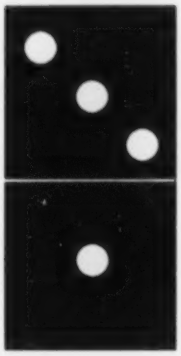


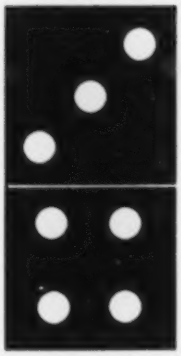
Add the dots on the dominoes. Write the numbers and signs. Follow the example.



$$\begin{array}{r} 4 \\ +\ 2 \\ \hline 6 \end{array}$$







Try adding the dots on real dominoes.

Write these problems in numbers and signs. Follow the example.

two and three is five

$$\begin{array}{r} 2 \\ +\ 3 \\ \hline 5 \end{array}$$

six plus two equals eight

one and one is two

zero plus nine equals nine

five plus eight is thirteen

three and seven is ten

Read each of these problems aloud. Remember that there is more than one way to read a problem.

$$\begin{array}{r} 1 \\ +\,3 \\ \hline 4 \end{array} \qquad \begin{array}{r} 5 \\ +\;\;2 \\ \hline 7 \end{array} \qquad \begin{array}{r} 2 \\ +\,6 \\ \hline 8 \end{array} \qquad \begin{array}{r} 4 \\ +\;\;7 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 8 \\ +\,2 \\ \hline 10 \end{array} \qquad \begin{array}{r} 6 \\ +\;\;3 \\ \hline 9 \end{array} \qquad \begin{array}{r} 9 \\ +\,5 \\ \hline 14 \end{array} \qquad \begin{array}{r} 3 \\ +\;\;2 \\ \hline 5 \end{array}$$

Put in the missing plus and equal signs. Follow the example.

2 + 3 = 5 6 2 8

1 1 2 0 9 9

4 2 6 3 1 4

6 4 10 7 0 7

Fill in the missing numbers. Follow the example.

one plus three equals four 1 + 3 = 4

five and two is seven + =

six plus zero equals six + =

four add seven is eleven + =

three and five is eight + =

zero plus nine is nine + =

six and eight is fourteen + =

two plus seven equals nine + =

ten plus three is thirteen + =

eleven add five is sixteen + =

Getting Used to Patterns

Here are the number combinations that equal 1.

$$\begin{array}{r} 1 \\ +\ 0 \\ \hline 1 \end{array} \qquad \begin{array}{r} 0 \\ +\ 1 \\ \hline 1 \end{array}$$

Here are the number combinations that equal 2. Practise adding them.

$$\begin{array}{r} 0 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 0 \\ \hline \end{array}$$

Here are the number combinations that equal 3. Practise adding them.

$$\begin{array}{r} 0 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 0 \\ \hline \end{array}$$

Here are the number combinations that equal 4. Practise adding them.

$$\begin{array}{r} 0 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 2 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ +\ 0 \\ \hline \end{array}$$

Here are the number combinations that equal 5. Practise adding them.

$$\begin{array}{r} 0 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 2 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 0 \\ \hline \end{array}$$

Here are the number combinations that equal 6. Practise adding them.

$$\begin{array}{r} 0 \\ +\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 0 \\ \hline \end{array}$$

Here are the number combinations that equal 7. Practise adding them.

$$\begin{array}{r} 0 \\ +\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 0 \\ \hline \end{array}$$

Here are the number combinations that equal 8. Practise adding them.

$$\begin{array}{r} 0 \\ +\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 5 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 1 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ +\ 0 \\ \hline \end{array}$$

Here are the number combinations that equal 9. Practise adding them.

$$\begin{array}{r} 0 \\ +\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 6 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 2 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 9 \\ +\ 0 \\ \hline \end{array}$$

Here are the number combinations that equal 10. Practise adding them.

$$\begin{array}{r} 0 \\ +\ 10 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 7 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 9 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ +\ 0 \\ \hline \end{array}$$

Getting used to these patterns helps you to add faster.

On this page, all of the questions on each line have the same answer except for one. Circle the question that has a different answer. Follow the example.

$$\begin{array}{r} 0 \\ +\ 2 \\ \hline 2 \end{array} \qquad \begin{array}{r} 1 \\ +\ 1 \\ \hline 2 \end{array} \qquad \begin{array}{r} 2 \\ +\ 0 \\ \hline 2 \end{array} \qquad \boxed{\begin{array}{r} 3 \\ +\ 1 \\ \hline 4 \end{array}}$$

- -

$$\begin{array}{r} 1 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 1 \\ \hline \end{array}$$

- -

$$\begin{array}{r} 2 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 1 \\ \hline \end{array}$$

Continue to circle the question in each line that has a different answer.

$$\begin{array}{r} 2 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 0 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ +\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 1 \\ \hline \end{array}$$

Add these numbers. Fill in the answers below the line.

$$\begin{array}{r} 1 \\ +\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ +\ 4 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 9 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 7 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 0 \\ +\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ +\ 3 \\ \hline \end{array}$$

Solving Problems

Try reading the problems and solving them together. You can use this page to write on.

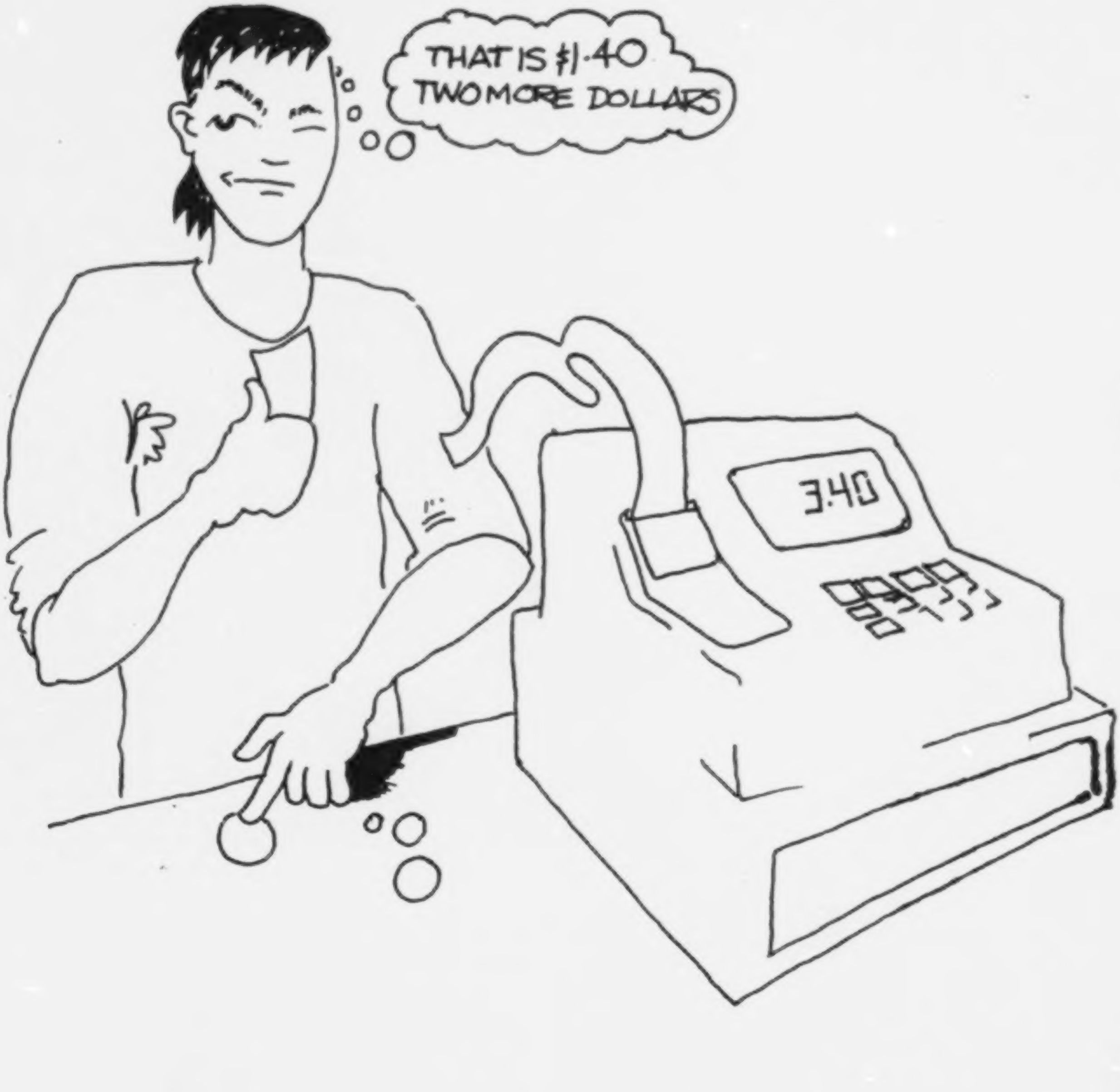
Ali has 2 brothers and 3 sisters. How many children did his parents have?

Angela went to school for 6 years when she was a child in her country. Later she went to a school for 1 year to learn sewing. How many years of schooling does she have in total?

Manuel needs to figure out how many days he took off from work last month. He took 2 days off when he had the flu and 2 days off to take care of his children when his wife was in the hospital. How many days was he away from work altogether?

Milo has a heart problem. He takes 2 pills after breakfast, 2 pills after lunch and 2 pills after supper. How many pills does he take every day?

Are there any questions in your life that you need to solve using adding? Talk to your tutor or fellow students about them and try solving them together.


THAT IS $1.40
TWO MORE DOLLARS
3.40

When do We Need to Subtract?

Consider this problem. If you are making coffee and tea for a group of people, you may want to find out how many cups of coffee and tea to make. One way to find out is by separately counting the people who want coffee and the people who want tea. If everyone wants either coffee or tea, there is another way to solve this problem. Count only the tea drinkers. You can now figure out how many coffee drinkers there are by subtracting. You need to subtract the number of tea drinkers from the total number of people. Then you will know how many people want coffee.

If you are in a group now, try this. If everyone in the group wants either tea or coffee, count only the people who want tea. Subtract this number from the total number of people and you will get the number of people who want coffee.

Can you subtract these numbers? If you are not sure, continue with this section to find out more about subtraction.

Signs and Words

In a group of 5 people, 3 people want tea, and the others want coffee. To know exactly how many people want coffee, you subtract these two numbers.

You can write the subtraction problem with the numbers on top of each other, like this:

$$\begin{array}{r} 5 \\ -\ 3 \\ \hline 2 \end{array}$$

This problem shows five minus three is two.

This sign – is the minus sign.
When you see a minus sign, you subtract.

You can also write subtraction problems with the numbers beside each other, like this:

$5 - 3 = 2$ This problem also shows five minus three is two.

These are the two ways to write a subtraction problem. No matter how you write the problem, the answer will be the same. There is more than one way to write a subtraction problem, and there is more than one way to talk about a subtraction problem.

When you see – you can say **subtract**, **minus** or **take away.**

When you see = you can say **equals** or **is.**

Here are some ways to talk about this number sentence : 5 – 3 = 2

five minus three is two

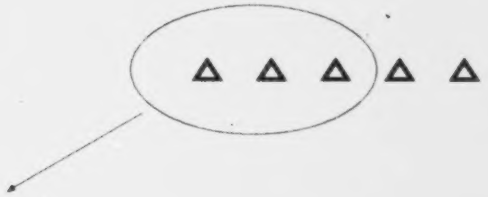
five take away three equals two

five subtract three is two

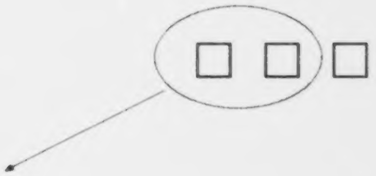
five minus three equals two

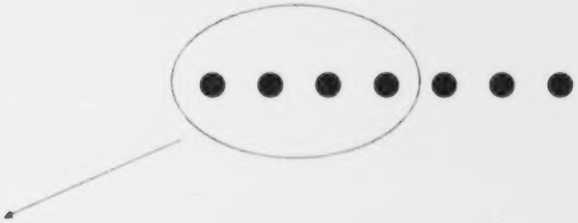
No matter how you talk about it, the meaning is the same.

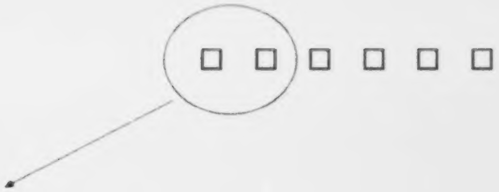
Notice what is taken away. Write the problem in numbers. Follow the example.



5 − 3 = 2







If you need more practice with this, use pennies, pencils or whatever is handy to show subtraction.

Write these problems in numbers and signs. Follow the example.

five subtract three is two

$$\begin{array}{r} 5 \\ -\quad 3 \\ \hline 2 \end{array}$$

eight take away two is six

two minus one equals one

nine take away nine is zero

thirteen minus eight is five

ten subtract seven equals three

Read each of these subtraction problems aloud. Remember that there is more than one way to read a problem.

$$\begin{array}{r} 4 \\ -\ 1 \\ \hline 3 \end{array} \qquad \begin{array}{r} 7 \\ -\ 2 \\ \hline 5 \end{array} \qquad \begin{array}{r} 9 \\ -\ 6 \\ \hline 3 \end{array} \qquad \begin{array}{r} 8 \\ -\ 3 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 10 \\ -\ 8 \\ \hline 2 \end{array} \qquad \begin{array}{r} 9 \\ -\ 3 \\ \hline 6 \end{array} \qquad \begin{array}{r} 4 \\ -\ 2 \\ \hline 2 \end{array} \qquad \begin{array}{r} 7 \\ -\ 3 \\ \hline 4 \end{array}$$

Put in the missing plus and equals signs. Follow the example.

5 − 2 = 3 8 3 5

10 8 2 6 6 0

9 5 4 7 0 7

Fill in the missing numbers. Follow the example.

four minus three is one 4 – 3 = 1

seven take away five is two – =

nine minus three equals six – =

ten subtract six is four – =

nine minus seven equals two – =

nine minus nine is zero – =

thirteen take away three is ten – =

ten minus five equals five – =

six subtract four is two – =

four minus zero is four – =

Getting Used to Patterns

Subtracting from 1.

$$\begin{array}{rr} 1 & 1 \\ -\ 0 & -\ 1 \\ \hline 1 & 0 \end{array}$$

Subtracting from 2. Fill in the answers.

$$\begin{array}{rrr} 2 & 2 & 2 \\ -\ 0 & -\ 1 & -\ 2 \\ \hline \end{array}$$

Subtracting from 3. Fill in the answers.

$$\begin{array}{rrrr} 3 & 3 & 3 & 3 \\ -\ 0 & -\ 1 & -\ 2 & -\ 3 \\ \hline \end{array}$$

Subtracting from 4. Fill in the answers.

$$\begin{array}{r} 4 \\ -\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ -\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ -\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ -\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -\ 4 \\ \hline \end{array}$$

Subtracting from 5. Fill in the answers.

$$\begin{array}{r} 5 \\ -\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ -\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ -\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ -\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ -\ 5 \\ \hline \end{array}$$

Subtracting from 6. Fill in the answers.

$$\begin{array}{rrrr} 6 & 6 & 6 & 6 \\ \underline{-\ 0} & \underline{-\ 1} & \underline{-\ 2} & \underline{-\ 3} \end{array}$$

$$\begin{array}{rrr} 6 & 6 & 6 \\ \underline{-\ 4} & \underline{-\ 5} & \underline{-\ 6} \end{array}$$

Subtracting from 7. Fill in the answers.

$$\begin{array}{rrrr} 7 & 7 & 7 & 7 \\ \underline{-\ 0} & \underline{-\ 1} & \underline{-\ 2} & \underline{-\ 3} \end{array}$$

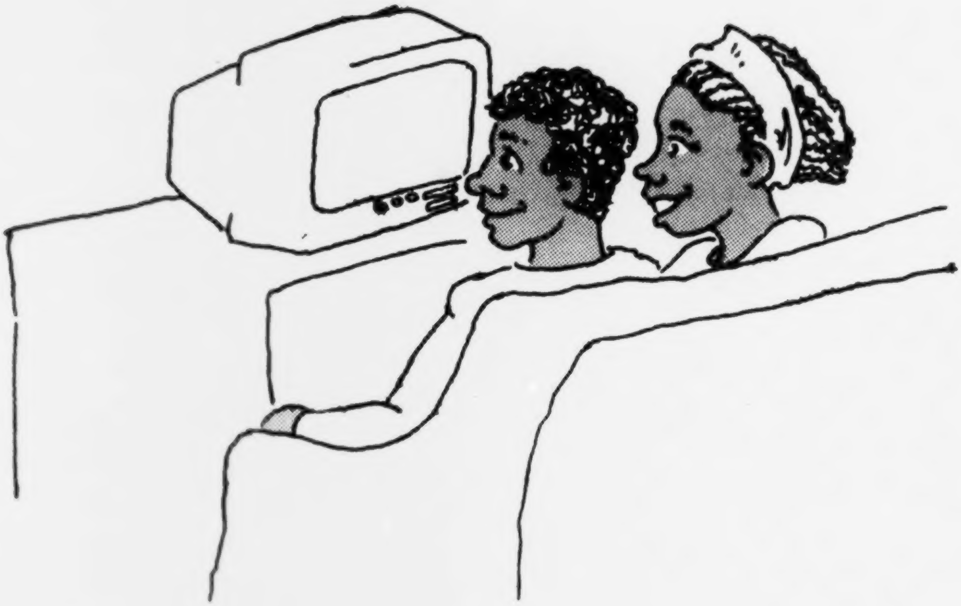
$$\begin{array}{rrrr} 7 & 7 & 7 & 7 \\ \underline{-\ 4} & \underline{-\ 5} & \underline{-\ 6} & \underline{-\ 7} \end{array}$$

Subtracting from 8. Fill in the answers.

$$\begin{array}{r} 8 \\ -\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ -\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ -\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ -\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ -\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ -\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ -\ 7 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -\ 8 \\ \hline \end{array}$$



Subtracting from 9. Fill in the answers.

$$\begin{array}{rrrr} 9 & 9 & 9 & 9 \\ -\ 0 & -\ 1 & -\ 2 & -\ 3 \\ \hline \end{array}$$

$$\begin{array}{rrrr} 9 & 9 & 9 & 9 \\ -\ 4 & -\ 5 & -\ 6 & -\ 7 \\ \hline \end{array}$$

$$\begin{array}{rr} 9 & 9 \\ -\ 8 & -\ 9 \\ \hline \end{array}$$

Subtracting from 10. Fill in the answers.

$$\begin{array}{r} 10 \\ -\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ -\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ -\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ -\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ -\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ -\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ -\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ -\ 7 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ -\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ -\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ -\ 10 \\ \hline \end{array}$$

Practise subtracting these numbers. Fill in the answers below the line.

$\begin{array}{r} 9 \\ -\ 1 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -\ 3 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ -\ 0 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ -\ 2 \\ \hline \end{array}$
$\begin{array}{r} 8 \\ -\ 7 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -\ 4 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ -\ 1 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -\ 5 \\ \hline \end{array}$
$\begin{array}{r} 4 \\ -\ 2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -\ 1 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ -\ 5 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ -\ 3 \\ \hline \end{array}$
$\begin{array}{r} 8 \\ -\ 5 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -\ 3 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -\ 0 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -\ 6 \\ \hline \end{array}$
$\begin{array}{r} 9 \\ -\ 8 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ -\ 2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ -\ 3 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -\ 5 \\ \hline \end{array}$

Solving Problems

Try reading the problems and solving them together.

Farida usually works 8 hours a day. One day last week she worked 10 hours. How many hours of overtime did she work?

Yesterday there were 9 students in the class. Today there are 7 students. How many students are away today?

Usually, it costs $8 to get into a movie, but on Tuesdays, it costs only $4. How much do you save if you go to a movie on Tuesday?

One day the temperature dropped from 10° C down to 2° C. By how many degrees did the temperature drop?

Lloyd owes his friend $5, but he has only a $10 bill. How much change should he get back from his friend?

Sergio has two children. The older child is 9 years old and the younger child is 6 years old. What is the difference in their ages?

Are there any questions in your life that you need to solve using subtraction? Talk to your tutor or fellow students about them and try solving them together.

Addition or Subtraction?

Fill in the missing plus or minus signs. Follow the examples.

$$\begin{array}{r} 4 \\ +\ 1 \\ \hline 5 \end{array} \qquad \begin{array}{r} 4 \\ -\ 1 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 5 \\ 2 \\ \hline 7 \end{array} \qquad \begin{array}{r} 5 \\ 2 \\ \hline 3 \end{array} \qquad \begin{array}{r} 4 \\ 3 \\ \hline 7 \end{array} \qquad \begin{array}{r} 4 \\ 3 \\ \hline 1 \end{array} \qquad \begin{array}{r} 6 \\ 3 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 8 \\ 1 \\ \hline 7 \end{array} \qquad \begin{array}{r} 3 \\ 1 \\ \hline 4 \end{array} \qquad \begin{array}{r} 7 \\ 3 \\ \hline 4 \end{array} \qquad \begin{array}{r} 9 \\ 0 \\ \hline 9 \end{array} \qquad \begin{array}{r} 5 \\ 5 \\ \hline 0 \end{array}$$

Checking Answers

Notice that adding and subtracting are opposite operations. They undo each other. Think about the relationship between these numbers.

$$7 + 2 = 9$$

$$9 - 2 = 7$$

If $9 - 2 = 7$, then it must be true that $7 + 2 = 9$

You can check answers to subtraction problems by adding.

Go back to some of the subtraction problems that you have done. Check your solutions by using addition.

Discuss whether to add or subtract.

You want to check that you got back the right change at the store. What can you do to find out?

You work part-time. You want to know how many hours you will get paid for this week. You know how many hours you worked each day. What can you do to find out?

You are shopping and need to know if you have enough money with you before you go to the check-out. What can you do to find out?

An enumerator needs to know how many adults live at a certain address. There are several families in the building. What can the enumerator do to find out?

Multiplying and Dividing: A Beginning

POP
POP
POP
POP
POP
POP

Notes for Multiplying and Dividing: A Beginning

- This section is for people who are not familiar with multiplying and dividing – the words, symbols, and concepts.

- This section includes the following:
  - reading and writing multiplication and division statements with the signs x, ÷, =
  - understanding how and when to multiply and divide
  - practice with patterns of multiplying and dividing numbers by 1, 2, 3, 4, 5.
  - considering problems involving multiplication and division at this level

- When introducing the concepts of multiplication and division, tactile objects should be used as often as possible.

- The relationship between multiplying and dividing as opposite operations is emphasized in this section. The facilitator should encourage learners to make this connection in concrete ways.

- The facilitator should encourage as much discussion and practice as the learner needs to feel confident with these operations and the vocabulary

- The facilitator should use other resources for extra practice when necessary.

When do We Need to Multiply?

Consider this problem. If you are buying drinks for a child's birthday party, you may want to estimate how many to buy. To figure this out, you need to know how many children are coming to the party. You also need to guess how many drinks each child will have. If you tried adding all of this, you would have a lot of numbers to work with. A quicker way to get an answer is to multiply. You can multiply the number of children times the number of drinks you think each child will have. Then you will have a total.

Try estimating how many drinks to buy for a group. You need to know how many people are in the group. You need to guess how many drinks to buy for each person. Then you multiply these numbers together.

Can you multiply these numbers? If you are not sure, continue with this section to find out more about multiplication.

Multiplying and Adding

What is the total number of drinks if there are 8 people and each person has 2 drinks? You can solve this problem two ways: by adding or by multiplying.

To solve the problem by adding, the solution looks like this:

$$\begin{array}{r} 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ +\ 2 \\ \hline 16 \end{array}$$

This addition solution shows the total of

8 groups of 2.

You can also multiply to solve this problem.

Signs and Words

This sign x is the times sign.
When you see a times sign, you multiply.

When you multiply, you can write the problem with the numbers on top of each other, like this:

$$\begin{array}{r} 2 \\ \times\ 8 \\ \hline 16 \end{array}$$

This problem shows eight times two is sixteen.

You can also write the problem with the numbers beside each other, like this:

$8 \times 2 = 16$

This problem also shows eight times two is sixteen.

These are two ways of writing a multiplication problem. No matter how you write the problem, the answer will be the same.

There is more than one way to write a multiplication problem, and there is more than one way to talk about a multiplication problem.

When you see x, you can say 5 **times** 2 is 10, or you can say 5 twos are 10. The meaning is the same, no matter which way you say it.

When you see = you can say **equals** or **is.**

Here are some ways to talk about this number sentence : 2 x 3 = 6

two times three is six

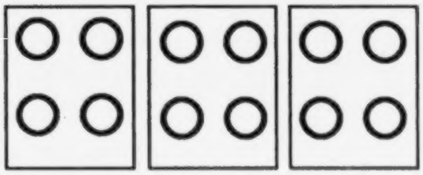
two threes are six

two times three equals six

two threes equal six

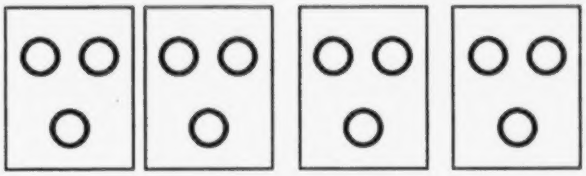
No matter how you talk about it, the meaning is the same.

Seeing Patterns



three groups of four
is twelve

3 x 4 means three groups of four
3 x 4 = 12



four groups of three
is twelve

4 x 3 means four groups of three
4 x 3 = 12

Notice that

- multiplying 4 times 3 is the same as multiplying 3 times 4
- adding 4 threes is the same as adding 3 fours
- 4 groups of 3 is the same as 3 groups of 4: they total 12

Write the number sentence as shown in the pictures. Follow the example.

□ □ □ □	□ □ □ □	□ □ □ □	=	12
3	groups of	4	=	12
3	x	4	=	12

● ● ●	● ● ●	● ● ●	=	9
	groups of		=	9
	x		=	9

■ ■   ■ ■ = 8
■ ■   ■ ■

groups of = 8

x = 8

△ △ △   △ △ △
△ △ △ = 15
△ △ △   △ △ △

groups of = 15

x = 15

Fill in the missing numbers. Follow the example.

three times two is six 3 x 2 = 6

five times two equals ten x =

three sixes are eighteen x =

two times seven is fourteen x =

three fives equals fifteen x =

four times four is sixteen x =

two times four equals eight x =

two times eight is sixteen x =

three threes are nine x =

four times five is twenty x =

Read each of these problems aloud. You can read it different ways.

$$\begin{array}{r} 2 \\ \times\ 3 \\ \hline 6 \end{array} \qquad \begin{array}{r} 5 \\ \times\ \ 4 \\ \hline 20 \end{array} \qquad \begin{array}{r} 6 \\ \times\ \ 2 \\ \hline 12 \end{array} \qquad \begin{array}{r} 3 \\ \times\ \ 7 \\ \hline 21 \end{array}$$

$$\begin{array}{r} 4 \\ \times\ \ 6 \\ \hline 24 \end{array} \qquad \begin{array}{r} 7 \\ \times\ \ 4 \\ \hline 28 \end{array} \qquad \begin{array}{r} 5 \\ \times\ \ 5 \\ \hline 25 \end{array} \qquad \begin{array}{r} 2 \\ \times\ \ 9 \\ \hline 18 \end{array}$$

Put in the times and equals signs. Follow the example.

2	x	6	=	12	6	5	30
9		2		18	4	8	32
3		9		27	7	4	28
5		7		35	8	3	24

Write these problems in numbers. Follow the example.

two times three is six

$$\begin{array}{r} 2 \\ \times\ 3 \\ \hline 6 \end{array}$$

six times two equals twelve

two twos are four

three times nine is twenty-seven

five eights are forty

four times seven equals twenty-eight

four fours are sixteen

Getting Used to Patterns

Multiplying by 2

1 x 2 = 2	one times two is two
2 x 2 = 4	two times two is four
3 x 2 = 6	three times two is six
4 x 2 = 8	four times two is eight
5 x 2 = 10	five times two is ten
6 x 2 = 12	six times two is twelve
7 x 2 = 14	seven times two is fourteen
8 x 2 = 16	eight times two is sixteen
9 x 2 = 18	nine times two is eighteen
10 x 2 = 20	ten times two is twenty

Multiplying by 3

1 x 3 = 3	one times three is three
2 x 3 = 6	two times three is six
3 x 3 = 9	three times three is nine
4 x 3 = 12	four times three is twelve
5 x 3 = 15	five times three is fifteen
6 x 3 = 18	six times three is eighteen
7 x 3 = 21	seven times three is twenty-one
8 x 3 = 24	eight times three is twenty-four
9 x 3 = 27	nine times three is twenty-seven
10 x 3 = 30	ten times three is thirty

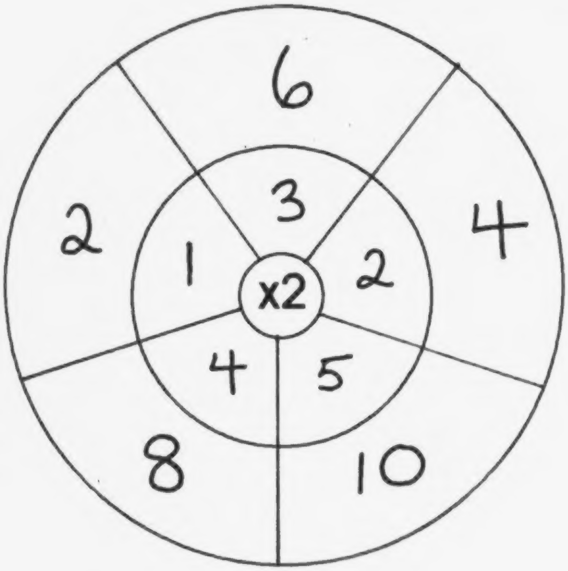
Multiplying by 4

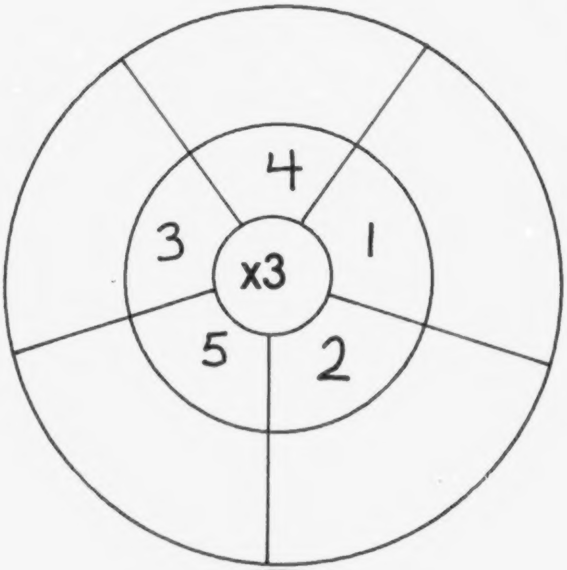
1	x	4	=	4	one times four is four
2	x	4	=	8	two times four is eight
3	x	4	=	12	three times four is twelve
4	x	4	=	16	four times four is sixteen
5	x	4	=	20	five times four is twenty
6	x	4	=	24	six times four is twenty-four
7	x	4	=	28	seven times four is twenty-eight
8	x	4	=	32	eight times four is thirty-two
9	x	4	=	36	nine times four is thirty-six
10	x	4	=	40	ten times four is forty

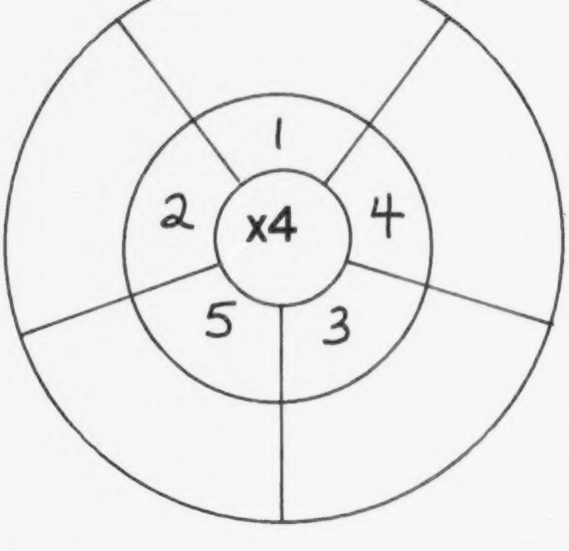
Multiplying by 5

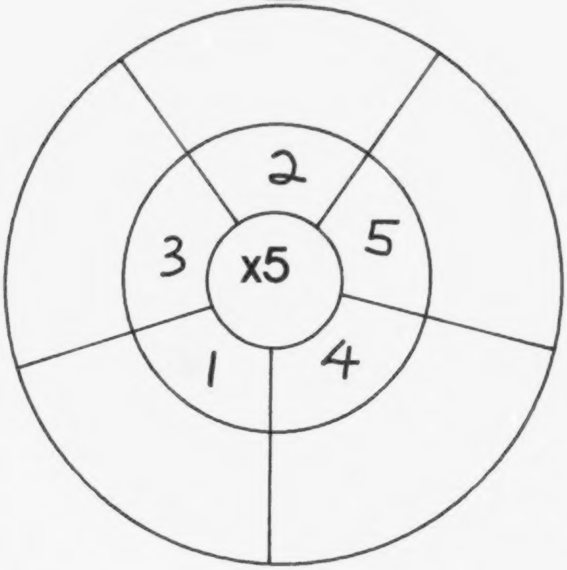
1 x 5 = 5	one times five is five
2 x 5 = 10	two times five is ten
3 x 5 = 15	three times five is fifteen
4 x 5 = 20	four times five is twenty
5 x 5 = 25	five times five is twenty–five
6 x 5 = 30	six times five is thirty
7 x 5 = 35	seven times five is thirty–five
8 x 5 = 40	eight times five is forty
9 x 5 = 45	nine times five is forty–five
10 x 5 = 50	ten times five is fifty

Practise multiplying. Write the answers in the spaces. Follow the example.


6
3
2
1
x2
2
4
4
5
8
10







Use the patterns to help you fill in the answers on this page.

5	6	3	7	3	8
x 5	x 2	x 4	x 5	x 7	x 5
4	6	2	5	3	8
x 5	x 3	x 2	x 2	x 4	x 4
5	4	2	9	6	3
x 8	x 6	x 7	x 3	x 2	x 2
6	4	5	8	2	3
x 4	x 2	x 9	x 3	x 6	x 6

Multiplying by 1

There are some special cases of multiplication. The first case is multiplying by one.

A number times one equals itself. Here are some examples.

1 x 1 = 1   2 x 1 = 2

3 x 1 = 3   4 x 1 = 4

5 x 1 = 5   6 x 1 = 6

7 x 1 = 7   8 x 1 = 8

9 x 1 = 9   10 x 1 = 10

Multiplying by Zero

Another special case is multiplying by zero.

When you see a multiplication problem with a zero in it, think of groupings. If you have groups of zero, what do you have? You have nothing. You have zero. Any number times zero always equals zero.

1 x 0 = 0
2 x 0 = 0
3 x 0 = 0
4 x 0 = 0
5 x 0 = 0
6 x 0 = 0
7 x 0 = 0
8 x 0 = 0
9 x 0 = 0
10 x 0 = 0

On this page, practise what you know about multiplying by one and by zero.

1 x 5 =

0 x 3 =

1 x 8 =

0 x 4 =

1 x 9 =

0 x 1 =

9 x 0 =

6 x 1 =

2 x 0 =

5 x 1 =

7 x 0 =

1 x 1 =

Solving Problems

Try reading the problems and solving them together.

Tran uses 2 TTC tickets a day to go to work and back home. He works 5 days a week. How many tickets does he use each week?

George wants to buy some mangoes. At $2 each, how much do 6 mangoes cost?

Marcie works 7 hours each day, 4 days a week. How many hours does she work each week?

How much do you make in a day if you work 5 hours at $6 an hour?

You are bringing a potato dish to a family dinner. There are 8 people and you estimate that each person can eat 2 potatoes. How many potatoes do you need for the dish?

Ria is buying apples for her children's lunches. She has 3 children. Each child eats an apple every day at lunch. How many apples does she need to buy for their lunches for 5 days?

Kaye, an instructor, has to add up the attendance for her class at the end of the week. 8 students came each day. There are 5 school days in the week. What is the total attendance for the week?

Are there any questions in your life that you need to solve using multiplication? Talk to your tutor or fellow students and try solving them together. Here are some suggestions.

Figure out how many hours you work in a day and in a week.

Figure out how much money it would cost to buy a number of things that are the same price; for example – 3 pencils.

When do We Need to Divide ?

Consider this problem. You are going to the beach with several friends and their children. You are buying a case of pop for everyone to share. If you want to know how many cans of pop there are for each person, you can divide to find out. If you divide the number of people into the number of cans, you will find out how many cans there are for each person.

If you are in a group now, try to find out how many cans each person will get if there are 24 cans altogether.

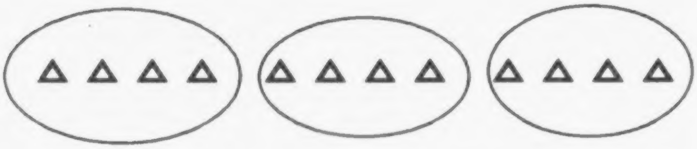
Can you divide these numbers? If you are not sure, continue with this section to find out more about division.

Dividing: An Understanding

Dividing is a way of making equal groups of numbers. For example, how many drinks can each person have if there are 24 drinks and 8 people? You need to divide to solve this problem. Dividing means that you find out how many are in each group.

△ △ △ △ △ △ △ △ △ △ △ △

Twelve
divided by three



means there are four in each group.

There are three groups of four.

Signs and Words

When you divide, you can say 8 **divided into** 24 is 3, or you can say 24 **divided by** 8 is 3.

You can write the problem this way:

$$\begin{array}{r} 3 \\ 8\overline{)\;24} \end{array}$$

This problem shows eight divided into twenty–four is three.

This sign $\overline{)}$ is the **divide into** sign. When you see this sign, you **divide** the number outside the sign **into** the number which is inside the sign. The answer goes on top of the line.

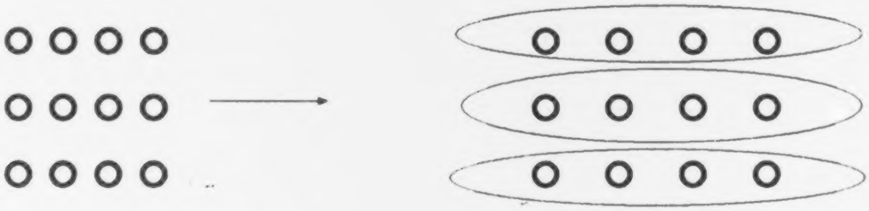
You can also write the problem like this:

$24 \div 8 = 3$

This problem shows twenty–four divided by eight is three.

This sign ÷ is the **divided by** sign.
When you see this sign, you **divide by** the following number.

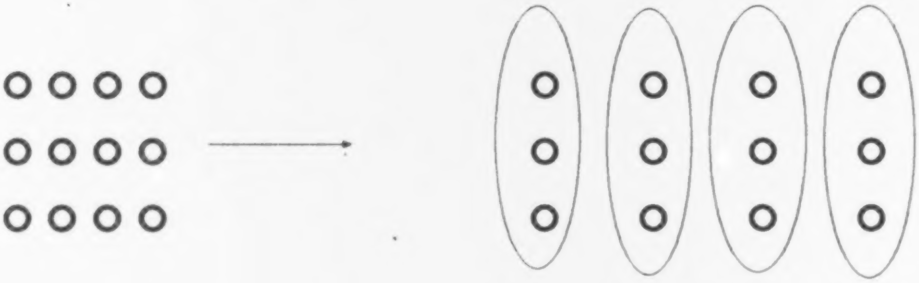
Seeing Patterns



$12 \div 3 = 4$

twelve divided by three is four

Twelve equals three groups of four.

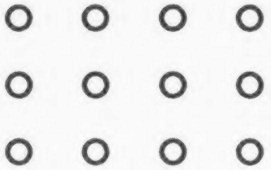


$12 \div 4 = 3$

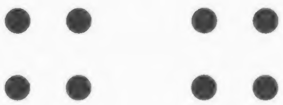
twelve divided by four is three

Twelve equals four groups of three.

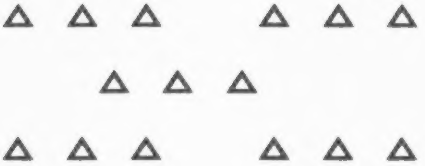
Look for the groupings of shapes. Then fill in the missing numbers in each division problem. Follow the example.



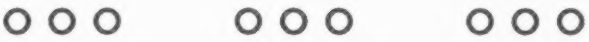
$$\begin{array}{r} 4 \\ 3\overline{)\,12} \end{array}$$



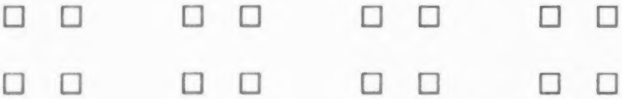
$$\overline{)\,8}$$



$$\overline{)\,15}$$



$$\overline{)\,9}$$



$$\overline{)\,16}$$

○ ○   ○ ○   ○ ○   ○ ○ $\overline{)\,8}$

■ ■   ■ ■   ■ ■   ■ ■   ■ ■
■ ■   ■ ■   ■ ■   ■ ■   ■ ■ $\overline{)\,20}$

○ ○   ○   ○ ○   ○   ○ ○   ○
○   ○ ○   ○   ○ ○   ○   ○ ○ $\overline{)\,18}$

□ □ □ □ □   □ □ □ □ □

□ □ □ □ □ $\overline{)\,15}$

● ● ● ● ●   ● ● ● ● ●

● ● ● ● ●

● ● ● ● ●   ● ● ● ● ● $\overline{)\,25}$

Read each of these problems aloud. Try different ways to talk about what is happening. Remember that there is a difference between divided by and divided into.

$\begin{array}{r} 2 \\ 5\overline{)\,10} \end{array}$ $\quad$ $\begin{array}{r} 3 \\ 3\overline{)\,9} \end{array}$ $\quad$ $\begin{array}{r} 2 \\ 4\overline{)\,8} \end{array}$ $\quad$ $\begin{array}{r} 6 \\ 2\overline{)\,12} \end{array}$

$\begin{array}{r} 2 \\ 3\overline{)\,6} \end{array}$ $\quad$ $\begin{array}{r} 3 \\ 4\overline{)\,12} \end{array}$ $\quad$ $\begin{array}{r} 2 \\ 2\overline{)\,4} \end{array}$ $\quad$ $\begin{array}{r} 3 \\ 6\overline{)\,18} \end{array}$

$8 \div 2 = 4$ $\quad$ $6 \div 3 = 2$ $\quad$ $10 \div 2 = 5$

$9 \div 3 = 3$ $\quad$ $12 \div 3 = 4$ $\quad$ $6 \div 2 = 3$

Put in the divided by and equals signs. Follow the example.

six divided by three is two 6 ÷ 3 = 2

ten divided by two is five 10 2 5

twenty divided by four is five 20 4 5

twelve divided by three is four 12 3 4

Fill in the missing numbers. Follow the example.

six divided by three is two 6 ÷ 3 = 2

ten divided by five is two ÷ =

fifteen divided by three is five ÷ =

nine divided by three is three ÷ =

seven divided into fourteen is two $\begin{array}{r}2\\7\overline{)\ 14}\end{array}$

four divided into sixteen is four $\overline{)}$

two divided into eight is four $\overline{)}$

eight divided into sixteen is two $\overline{)}$

Decide which way to write each of the following problems. Write them using numbers and signs.

seven into twenty-one is three

twenty divided by two is ten

thirty divided by five is six

three divided into fifteen is five

Getting Used to Patterns

Dividing by 2

$2 \div 2 = 1$

$4 \div 2 = 2$

$6 \div 2 = 3$

$8 \div 2 = 4$

$10 \div 2 = 5$

$12 \div 2 = 6$

$14 \div 2 = 7$

$16 \div 2 = 8$

$18 \div 2 = 9$

$20 \div 2 = 10$

Dividing by 3

3 ÷ 3 = 1

6 ÷ 3 = 2

9 ÷ 3 = 3

12 ÷ 3 = 4

15 ÷ 3 = 5

18 ÷ 3 = 6

21 ÷ 3 = 7

24 ÷ 3 = 8

27 ÷ 3 = 9

30 ÷ 3 = 10

Dividing by 4

$4 \div 4 = 1$

$8 \div 4 = 2$

$12 \div 4 = 3$

$16 \div 4 = 4$

$20 \div 4 = 5$

$24 \div 4 = 6$

$28 \div 4 = 7$

$32 \div 4 = 8$

$36 \div 4 = 9$

$40 \div 4 = 10$

Dividing by 5

$5 \div 5 = 1$

$10 \div 5 = 2$

$15 \div 5 = 3$

$20 \div 5 = 4$

$25 \div 5 = 5$

$30 \div 5 = 6$

$35 \div 5 = 7$

$40 \div 5 = 8$

$45 \div 5 = 9$

$50 \div 5 = 10$

Special Case – Dividing by 1

Here is a special case of dividing.
Any number divided by one equals itself.

$1 \div 1 = 1$ $2 \div 1 = 2$

$3 \div 1 = 3$ $4 \div 1 = 4$

$5 \div 1 = 5$ $6 \div 1 = 6$

$7 \div 1 = 7$ $8 \div 1 = 8$

$9 \div 1 = 9$ $10 \div 1 = 10$

Try solving these division problems.

$8 \div 1 =$ $5 \div 1 =$ $2 \div 1 =$

$6 \div 1 =$ $9 \div 1 =$ $10 \div 1 =$

$1\overline{)\ 4}$ $1\overline{)\ 7}$ $1\overline{)\ 3}$

Dividing Practice

$5\overline{)\,10}$ $2\overline{)\,8}$ $3\overline{)\,12}$ $1\overline{)\,9}$

$2\overline{)\,6}$ $1\overline{)\,4}$ $4\overline{)\,8}$ $4\overline{)\,12}$

$3\overline{)\,6}$ $2\overline{)\,10}$ $5\overline{)\,25}$ $4\overline{)\,16}$

$3\overline{)\,15}$ $2\overline{)\,12}$ $4\overline{)\,20}$ $5\overline{)\,15}$

$2\overline{)\,14}$ $3\overline{)\,18}$ $4\overline{)\,24}$ $3\overline{)\,27}$

Solving Problems

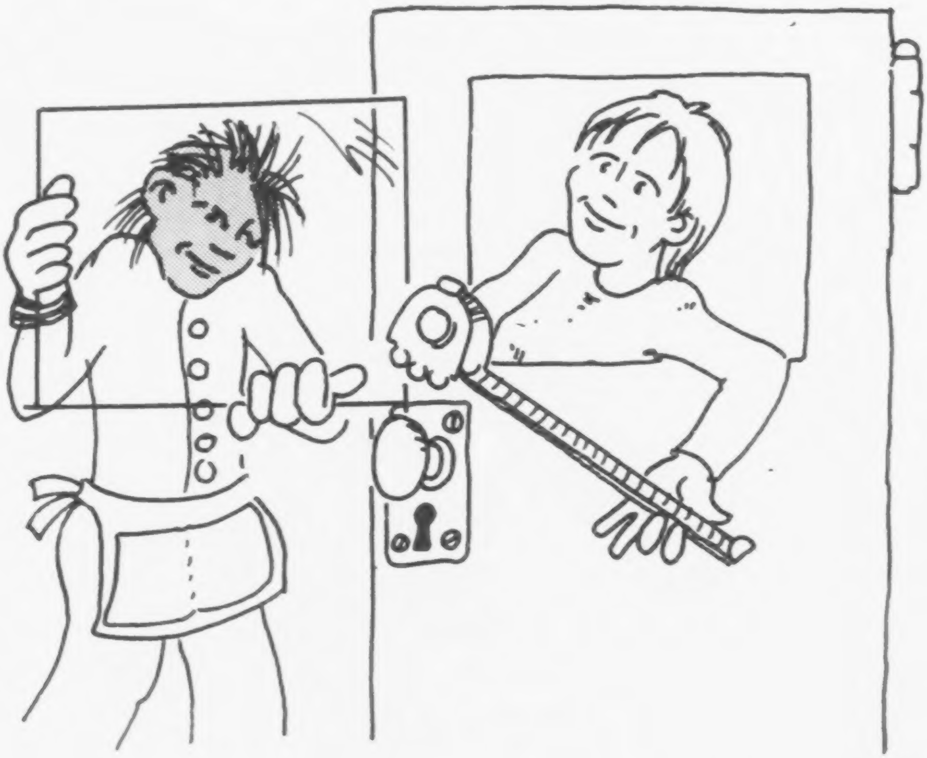
There are 4 friends who share an apartment and share the bills. The last phone bill was $28. How much should each person pay?

After paying his rent and his bills and buying groceries, Marco has $49 left to last the week (7 days). How much can he spend each day?

Tomas is buying barbequed chickens for a big party. There will be 24 people. He figures that 3 people can eat one chicken. How many chickens does he need to buy?

Berthe does some babysitting in the evenings. She charges $4 an hour. She made $36 babysitting last week. How many hours did she babysit?

Are there any questions in your life that you need to solve using division? Talk to your tutor or fellow students about them and try solving them together.



Which Sign Belongs?

Fill in the missing times or divided by signs. Follow the examples.

15 ÷ 5 = 3

4   9 = 36

16   4 = 4

1   7 = 7

4   6 = 24

7   3 = 21

3 x 6 = 18

3   8 = 24

5   8 = 40

20   2 = 10

36   6 = 6

5   5 = 25

Checking Your Answers

When multiplying or dividing, how do you know when your answers are right? Since multiplying and dividing are opposite operations and they undo each other, you can check division questions by multiplying.

When dividing, check by multiplying.

$$\begin{array}{r} 3 \\ 4\overline{)\;12} \end{array} \quad \longrightarrow \quad 3 \times 4 = 12$$

Multiply your answer by the divisor – the number outside the sign – and you should get the dividend – the number inside the sign. If that's not what you get, you need to take another look at your work.

Look at this problem. $\begin{array}{r} ? \\ 2\overline{)\,10} \end{array}$

Try 4 as the answer.

$$\begin{array}{r} 4 \\ 2\overline{)\,10} \end{array} \dashrightarrow \quad 4 \times 2 = 8$$

8 is not big enough.
Try again with a
bigger number.

Try 5 as the answer.

$$\begin{array}{r} 5 \\ 2\overline{)\,10} \end{array} \dashrightarrow \quad 5 \times 2 = 10$$

This is the number
under the dividing
sign. So the answer
is 5.

Go back to the page of dividing practice and check your answers by multiplying.

Discuss whether to multiply or divide.

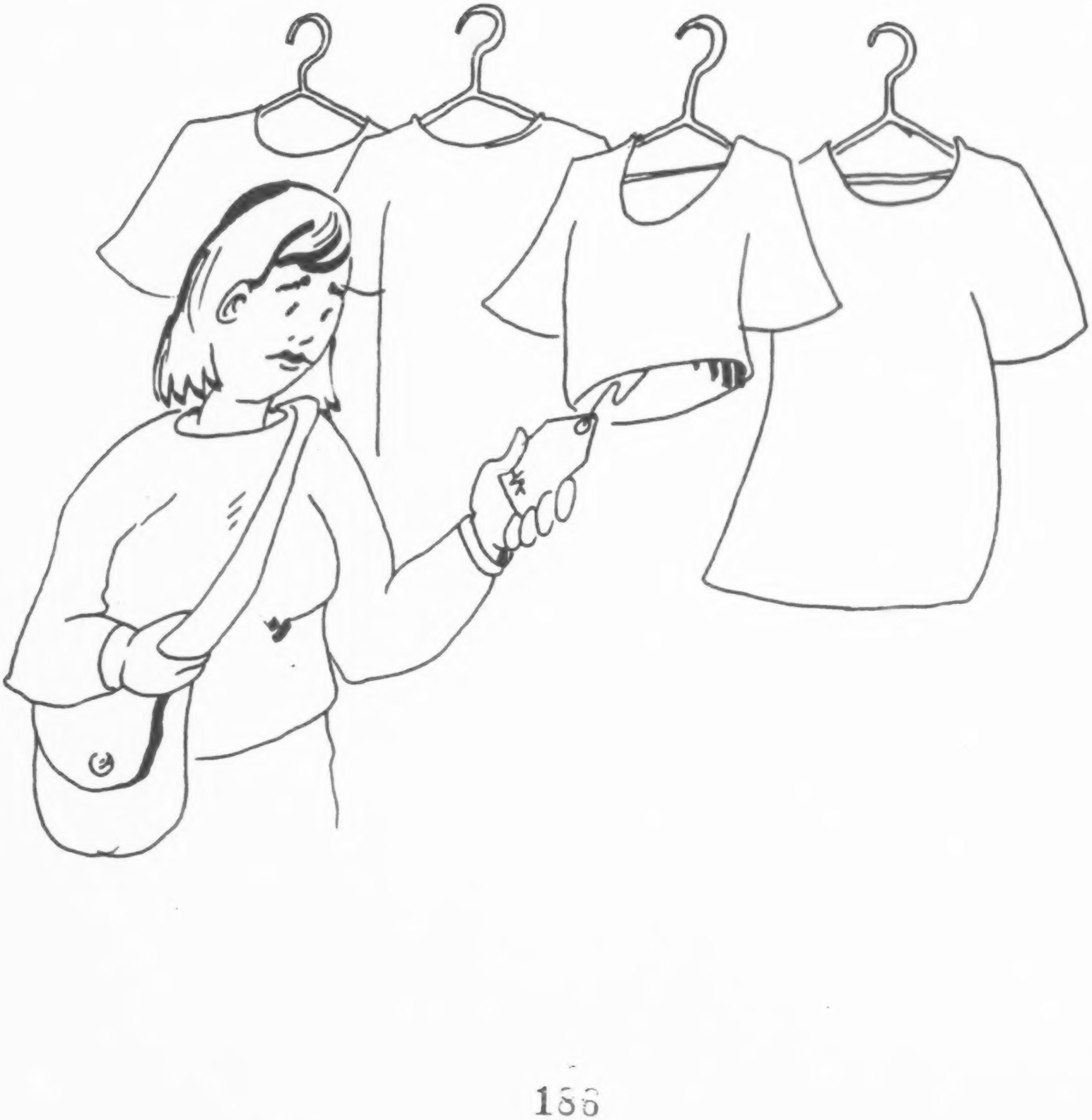
You want to increase the quantities in your favourite recipe to make enough for a large group. What can you do to find out?

You are buying some soft drinks by the case. You want to know what each can costs. What can you do to find out?

You get paid once a week. You want to know how much to put aside each week to meet your monthly rent payment. What can you do to find out?

You and your friends order a pizza. You want to pay an equal share of the cost. What can you do to find out?

More Adding and Subtracting



Notes for More Adding and Subtracting

- This section is for people who have some familiarity with adding and subtracting but who need some practice with numbers up to 20 before going on to carrying and borrowing.

- This section includes the following:
  - adding to sums of up to 19
  - subtracting from numbers between 10 and 19
  - practice with patterns that reinforce basic addition and subtraction skills
  - introduction to solving word problems

- The skills presented in this section are essential for further learning of carrying and borrowing. As much as possible, the number patterns/facts should be committed to memory so that they become automatic. Games and other interesting activities can be created to help the learner practise the operational skills.

- Until number patterns become automatic (for example, knowing that 7 + 3 = 10), adding is actually the same as counting. It is alright for students to count on their fingers. We all do it. Learning the patterns by heart will take time.

- As often as possible, the abstract skills should be related to everyday situations. The facilitator should encourage the learners to create their own word problems.

- There are many pages of practice with patterns. For each number value, provide the opportunity for the learner to use concrete objects. This will help with an understanding of what the number really represents. For example, manipulating all the combinations of numbers that add up to 18 and that subtract from 18 leads to an understanding of 18.

More About Adding and Subtracting

You are getting used to adding and subtracting. You understand when to add and when to subtract. You are able to talk about your decisions and explain them. Now you can consider a new problem. When adding and subtracting numbers past 10, how do you work with two digits?

If you are not sure, continue with this section to find out more about addition and subtraction.

Consider this Problem

You want to buy two T-shirts. You do not know if you have enough money with you to buy them. The price of one is $8 and the price of the other is $7. To get a total, you can add the two numbers together.

$$8 + 7 = ?$$

You can figure this out by counting. You can also figure this out by adding.

You have $9. Do you have enough money to buy the T-shirts? How much more money do you need? To find out, you can subtract.

$$15 - 9 = ?$$

If you are not sure how to use addition and subtraction to figure out these totals, and you would like help, continue with this section.

Adding Numbers Bigger than 10

Add these numbers. When you fill in the answer, you bring down the 10 too. Follow the example.

12	15	14	13
+ 1	+ 2	+ 4	+ 3
13			

Here is a different example.

7
+ 8
15

Notice that after adding, you have a 10 to bring down.

Add these numbers. Follow the example.

5	8	9	7	3	4
+ 9	+ 8	+ 5	+ 6	+ 9	+ 7
14					

Subtracting Numbers Bigger than 10

Some of the numbers on this page are bigger than the numbers 1 to 9. These numbers have two digits. Notice the two-digit numbers in these subtraction problems.

15	fifteen	19	nineteen
– 3	minus three	– 9	minus nine
12	is twelve	10	is ten

Subtract these numbers. When you fill in the answer below the line, you bring down the 10 too. Follow the example.

18	12	16	14	17	13
– 6	– 1	– 2	– 4	– 4	– 2
12					

18	15	11	19	16	17
– 5	– 2	– 1	– 5	– 4	– 3

Here is a different example.

15	Notice that
− 8	8 is bigger than 5.
?	

Use the 10 to help subtract.

15	fifteen
− 8	minus eight
7	is seven

Here is another example.

12	Notice that
− 7	7 is bigger than 2.
?	

Use the 10 to help subtract.

12	twelve
− 7	minus seven
5	is five

Checking Your Solutions

$$\begin{array}{r} 12 \\ -\ 7 \\ \hline 5 \end{array}$$

To check your solution,
undo it by adding.

Go backwards.
Add up from
the bottom.

$$\begin{array}{lr} & 12 \\ \hline \uparrow & 7 \\ & 5 \end{array}$$

The sum should be the same as the top number.

$5 + 7 = 12 \longrightarrow 12 - 7 = 5$

Here is another example.

$$\begin{array}{r} 15 \\ -\ 6 \\ \hline 7 \end{array}$$

Is this solution right?
To check, add.

$$\begin{array}{r} 7 \\ +\ 6 \\ \hline 13 \end{array}$$

⟶ The answer is not 15,
so we know the solution
is not the right one.

Getting Used to Patterns

Add these numbers together.

0	1	2	3	4	5
+10	+ 9	+ 8	+ 7	+ 6	+ 5

6	7	8	9	10
+ 4	+ 3	+ 2	+ 1	+ 0

Notice that these totals are all the same.

Practise subtracting from 10. Fill in the solutions and check by adding.

10	10	10	10	10	10
– 0	– 1	– 2	– 3	– 4	– 5

$$\begin{array}{ccccc} 10 & 10 & 10 & 10 & 10 \\ -\ 6 & -\ 7 & -\ 8 & -\ 9 & -\ 10 \\ \hline \end{array}$$

Add these numbers together.

$$\begin{array}{cccccc} 0 & 1 & 2 & 3 & 4 & 5 \\ +11 & +10 & +\ 9 & +\ 8 & +\ 7 & +\ 6 \\ \hline \end{array}$$

$$\begin{array}{cccccc} 6 & 7 & 8 & 9 & 10 & 11 \\ +\ 5 & +\ 4 & +\ 3 & +\ 2 & +\ 1 & +\ 0 \\ \hline \end{array}$$

Notice that the totals are all the same.

Practise subtracting from 11. Fill in the solutions and check by adding.

$$\begin{array}{cccccc} 11 & 11 & 11 & 11 & 11 & 11 \\ -\ 0 & -\ 1 & -\ 2 & -\ 3 & -\ 4 & -\ 5 \\ \hline \end{array}$$

$$\begin{array}{rrrrrr} 11 & 11 & 11 & 11 & 11 & 11 \\ -\ 6 & -\ 7 & -\ 8 & -\ 9 & -10 & -11 \\ \hline \end{array}$$

Add these numbers together.

$$\begin{array}{rrrrrr} 0 & 1 & 2 & 3 & 4 & 5 \\ +12 & +11 & +10 & +\ 9 & +\ 8 & +\ 7 \\ \hline \end{array}$$

$$\begin{array}{rrrrrr} 6 & 7 & 8 & 9 & 10 & 11 \\ +\ 6 & +\ 5 & +\ 4 & +\ 3 & +\ 2 & +\ 1 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ +\ 0 \\ \hline \end{array}$$

Notice that the totals are all the same.

Practise subtracting from 12. Fill in the solutions and check by adding.

12	12	12	12	12	12
− 0	− 1	− 2	− 3	− 4	− 5

12	12	12	12	12	12
− 6	− 7	− 8	− 9	−10	−11

12
−12

Add these numbers together.

0	1	2	3	4	5
+13	+12	+11	+10	+ 9	+ 8

6	7	8	9	10	11
+ 7	+ 6	+ 5	+ 4	+ 3	+ 2

$$\begin{array}{r} 12 \\ +\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ +\ 0 \\ \hline \end{array}$$

Notice that the totals are all the same.

Practise subtracting from 13. Fill in the solutions and check by adding.

$$\begin{array}{r} 13 \\ -\ 0 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ 5 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ -\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -10 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -11 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ -12 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -13 \\ \hline \end{array}$$

Add these numbers together.

$$\begin{array}{rrrrrr} 0 & 1 & 2 & 3 & 4 & 5 \\ \underline{+14} & \underline{+13} & \underline{+12} & \underline{+11} & \underline{+10} & \underline{+\ 9} \end{array}$$

$$\begin{array}{rrrrrr} 6 & 7 & 8 & 9 & 10 & 11 \\ \underline{+\ 8} & \underline{+\ 7} & \underline{+\ 6} & \underline{+\ 5} & \underline{+\ 4} & \underline{+\ 3} \end{array}$$

$$\begin{array}{rrr} 12 & 13 & 14 \\ \underline{+\ 2} & \underline{+\ 1} & \underline{+\ 0} \end{array}$$

Notice that the totals are all the same.

Practise subtracting from 14. Fill in the solutions and check by adding.

$$\begin{array}{rrrrrr} 14 & 14 & 14 & 14 & 14 & 14 \\ \underline{-\ 0} & \underline{-\ 1} & \underline{-\ 2} & \underline{-\ 3} & \underline{-\ 4} & \underline{-\ 5} \end{array}$$

$\begin{array}{r}14\\-\ 6\\\hline\end{array}$ $\begin{array}{r}14\\-\ 7\\\hline\end{array}$ $\begin{array}{r}14\\-\ 8\\\hline\end{array}$ $\begin{array}{r}14\\-\ 9\\\hline\end{array}$ $\begin{array}{r}14\\-10\\\hline\end{array}$ $\begin{array}{r}14\\-11\\\hline\end{array}$

$\begin{array}{r}14\\-12\\\hline\end{array}$ $\begin{array}{r}14\\-13\\\hline\end{array}$ $\begin{array}{r}14\\-14\\\hline\end{array}$

Add these numbers together.

$\begin{array}{r}15\\+\ 0\\\hline\end{array}$ $\begin{array}{r}14\\+\ 1\\\hline\end{array}$ $\begin{array}{r}13\\+\ 2\\\hline\end{array}$ $\begin{array}{r}12\\+\ 3\\\hline\end{array}$ $\begin{array}{r}11\\+\ 4\\\hline\end{array}$ $\begin{array}{r}10\\+\ 5\\\hline\end{array}$

$\begin{array}{r}9\\+\ 6\\\hline\end{array}$ $\begin{array}{r}8\\+\ 7\\\hline\end{array}$ $\begin{array}{r}7\\+\ 8\\\hline\end{array}$ $\begin{array}{r}6\\+\ 9\\\hline\end{array}$ $\begin{array}{r}5\\+10\\\hline\end{array}$ $\begin{array}{r}4\\+11\\\hline\end{array}$

$\begin{array}{r}3\\+12\\\hline\end{array}$ $\begin{array}{r}2\\+13\\\hline\end{array}$ $\begin{array}{r}1\\+14\\\hline\end{array}$ $\begin{array}{r}0\\+15\\\hline\end{array}$

Notice that the totals are all the same.

Practise subtracting from 15. Fill in the solutions and check by adding.

15	15	15	15	15	15
− 0	− 1	− 2	− 3	− 4	− 5

15	15	15	15	15	15
− 6	− 7	− 8	− 9	−10	−11

15	15	15	15
−12	−13	−14	−15

Add these numbers together.

0	1	2	3	4	5
+16	+15	+14	+13	+12	+11

$$\begin{array}{rrrrrr} 6 & 7 & 8 & 9 & 10 & 11 \\ +10 & +\ 9 & +\ 8 & +\ 7 & +\ 6 & +\ 5 \\ \hline \end{array}$$

$$\begin{array}{rrrrr} 12 & 13 & 14 & 15 & 16 \\ +\ 4 & +\ 3 & +\ 2 & +\ 1 & +\ 0 \\ \hline \end{array}$$

Notice that the totals are all the same.

Practise subtracting from 16. Fill in the solutions and check by adding.

$$\begin{array}{rrrrrr} 16 & 16 & 16 & 16 & 16 & 16 \\ -\ 0 & -\ 1 & -\ 2 & -\ 3 & -\ 4 & -\ 5 \\ \hline \end{array}$$

$$\begin{array}{rrrrrr} 16 & 16 & 16 & 16 & 16 & 16 \\ -\ 6 & -\ 7 & -\ 8 & -\ 9 & -10 & -11 \\ \hline \end{array}$$

$$\begin{array}{rrrrr} 16 & 16 & 16 & 16 & 16 \\ -12 & -13 & -14 & -15 & -16 \\ \hline \end{array}$$

Add these numbers together.

$$\begin{array}{rrrrrr} 0 & 1 & 2 & 3 & 4 & 5 \\ \underline{+17} & \underline{+16} & \underline{+15} & \underline{+14} & \underline{+13} & \underline{+12} \end{array}$$

$$\begin{array}{rrrrrr} 6 & 7 & 8 & 9 & 10 & 11 \\ \underline{+11} & \underline{+10} & \underline{+\ 9} & \underline{+\ 8} & \underline{+\ 7} & \underline{+\ 6} \end{array}$$

$$\begin{array}{rrrrrr} 12 & 13 & 14 & 15 & 16 & 17 \\ \underline{+\ 5} & \underline{+\ 4} & \underline{+\ 3} & \underline{+\ 2} & \underline{+\ 1} & \underline{+\ 0} \end{array}$$

Notice that the totals are all the same.

Practise subtracting from 17. Fill in the solutions and check by adding.

$$\begin{array}{rrrrrr} 17 & 17 & 17 & 17 & 17 & 17 \\ \underline{-\ 0} & \underline{-\ 1} & \underline{-\ 2} & \underline{-\ 3} & \underline{-\ 4} & \underline{-\ 5} \end{array}$$

17	17	17	17	17	17
− 6	− 7	− 8	− 9	−10	−11

17	17	17	17	17	17
−12	−13	−14	−15	−16	−17

Add these numbers together.

0	1	2	3	4	5
+18	+17	+16	+15	+14	+13

6	7	8	9	10	11
+12	+11	+10	+ 9	+ 8	+ 7

12	13	14	15	16	17	18
+ 6	+ 5	+ 4	+ 3	+ 2	+ 1	+ 0

Notice that the totals are all the same.

Practise subtracting from 18. Fill in the solutions and check by adding.

18	18	18	18	18	18
- 0	- 1	- 2	- 3	- 4	- 5

18	18	18	18	18	18
- 6	- 7	- 8	- 9	-10	-11

18	18	18	18	18	18
-12	-13	-14	-15	-16	-17

18
-18

Add these numbers together.

0	1	2	3	4	5
+19	+18	+17	+16	+15	+14
6	7	8	9	10	11
+13	+12	+11	+10	+ 9	+ 8
12	13	14	15	16	17
+ 7	+ 6	+ 5	+ 4	+ 3	+ 2
18	19				
+ 1	+ 0				

Notice that the totals are all the same.

Practise subtracting from 19. Fill in the solutions and check by adding.

$$\begin{array}{r}19\\-\ 0\\\hline\end{array}\qquad\begin{array}{r}19\\-\ 1\\\hline\end{array}\qquad\begin{array}{r}19\\-\ 2\\\hline\end{array}\qquad\begin{array}{r}19\\-\ 3\\\hline\end{array}\qquad\begin{array}{r}19\\-\ 4\\\hline\end{array}\qquad\begin{array}{r}19\\-\ 5\\\hline\end{array}$$

$$\begin{array}{r}19\\-\ 6\\\hline\end{array}\qquad\begin{array}{r}19\\-\ 7\\\hline\end{array}\qquad\begin{array}{r}19\\-\ 8\\\hline\end{array}\qquad\begin{array}{r}19\\-\ 9\\\hline\end{array}\qquad\begin{array}{r}19\\-10\\\hline\end{array}\qquad\begin{array}{r}19\\-11\\\hline\end{array}$$

$$\begin{array}{r}19\\-12\\\hline\end{array}\qquad\begin{array}{r}19\\-13\\\hline\end{array}\qquad\begin{array}{r}19\\-14\\\hline\end{array}\qquad\begin{array}{r}19\\-15\\\hline\end{array}\qquad\begin{array}{r}19\\-16\\\hline\end{array}\qquad\begin{array}{r}19\\-17\\\hline\end{array}$$

$$\begin{array}{r}19\\-18\\\hline\end{array}\qquad\begin{array}{r}19\\-19\\\hline\end{array}$$

Adding and Subtracting Practice

Fill in the missing signs or numbers.

5	16	1	12	18	9
+ 6	6	4	− 8	9	+ 7
	10	5		9	

5	8	15	4	14	17
+ 7	2	−13	0	7	−11
	10		4	7	

7	2	10	9	15	13
+ 3	3	− 5	+ 4	9	−12
	5			6	

11	7	3	19	4	12
− 6	1	+ 8	17	+ 6	4
	8		2		8

$$\begin{array}{r} 6 \\ 1 \\ \hline 5 \end{array} \qquad \begin{array}{r} 4 \\ +\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 15 \\ -\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ 3 \\ \hline 5 \end{array} \qquad \begin{array}{r} 19 \\ -\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ 3 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 14 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 16 \\ -\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 0 \\ 8 \\ \hline 8 \end{array} \qquad \begin{array}{r} 9 \\ -\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ 3 \\ \hline 9 \end{array} \qquad \begin{array}{r} 5 \\ +\ 8 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \\ -15 \\ \hline \end{array} \qquad \begin{array}{r} 16 \\ 5 \\ \hline 11 \end{array} \qquad \begin{array}{r} 9 \\ -\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 14 \\ 3 \\ \hline 17 \end{array} \qquad \begin{array}{r} 7 \\ +\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ 9 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 15 \\ -\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ +\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 17 \\ 8 \\ \hline 9 \end{array} \qquad \begin{array}{r} 12 \\ 9 \\ \hline 3 \end{array} \qquad \begin{array}{r} 6 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 11 \\ 2 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 8 \\ +\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ 7 \\ \hline 12 \end{array} \qquad \begin{array}{r} 10 \\ 4 \\ \hline 6 \end{array} \qquad \begin{array}{r} 18 \\ 9 \\ \hline 9 \end{array} \qquad \begin{array}{r} 3 \\ +\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 16 \\ 16 \\ \hline 0 \end{array}$$

What is 10 equal to? What is 5 equal to? Write questions to equal the given total. Follow the example.

10 = 1 + 9 = 12 − 2 = 6 + 4 . . .

5 =

12 =

7 =

16 =

13 =

18 =

11 =

17 =

9 =

Adding Columns

Sometimes you need to add lists, or columns, of numbers. When you add several numbers, you are actually adding two numbers at a time. Each time you get a total, you add it to the next number. You go through the numbers one by one keeping each total in your head until the end.

2	two
	plus three
3	is five
	plus
8	eight
13	is thirteen

5	five
	plus four
4	is nine
	plus
6	six
15	is fifteen

Add these columns one number at a time until you get a final total.

$$\begin{array}{ccc} 8 & 3 & 4 \\ 6 & 8 & 7 \\ \underline{\;2\;} & \underline{\;5\;} & \underline{\;6\;} \end{array}$$

$$\begin{array}{ccc} 9 & 6 & 2 \\ 5 & 8 & 5 \\ \underline{\;2\;} & \underline{\;3\;} & \underline{\;4\;} \end{array}$$

$$\begin{array}{ccc} 7 & 5 & 1 \\ 3 & 6 & 8 \\ \underline{\;6\;} & \underline{\;7\;} & \underline{\;9\;} \end{array}$$

Solving Problems

To solve the problems on the following pages, you will need to decide whether to add or subtract. Read the problems carefully.

Here are four steps for problem solving.

1. Make sure you understand the problem. Read it again. Discuss it with a friend or tutor.
2. Ask yourself what you have to do to solve the problem. Do you have to add or subtract?
3. Find the numbers that you need to solve the problem.
4. Write the problem using numbers and signs, and then solve it.

Here are some problems to read. When you work on a problem, write your work on some paper. That way you can look back on your work later if you need to check it.

Ingrid bought two new T-shirts. One was $6 and one was $8. How much money did she spend?

Frank is buying a music cassette tape. He has $16 with him. The bill for the tape totals $9. How much money will he have left after he pays for the tape?

Maria is making some jackets and pants for her sons. She needs 12 metres of material for the jackets and 7 metres for the pants. How many metres of material does she need to buy?

Mohammed is building some wooden steps. He needs 15 metres of boards. He already has 3 metres of boards at home. How many metres of wooden boards does he need to buy?

The temperature at noon was 17°C. At 10:00 p.m. the temperature was 6°C. How many degrees did the temperature drop?

Su Ling worked for 14 weeks last winter and then she was laid off. In the summer she was called back to work for 8 more weeks. How many weeks did she work altogether?

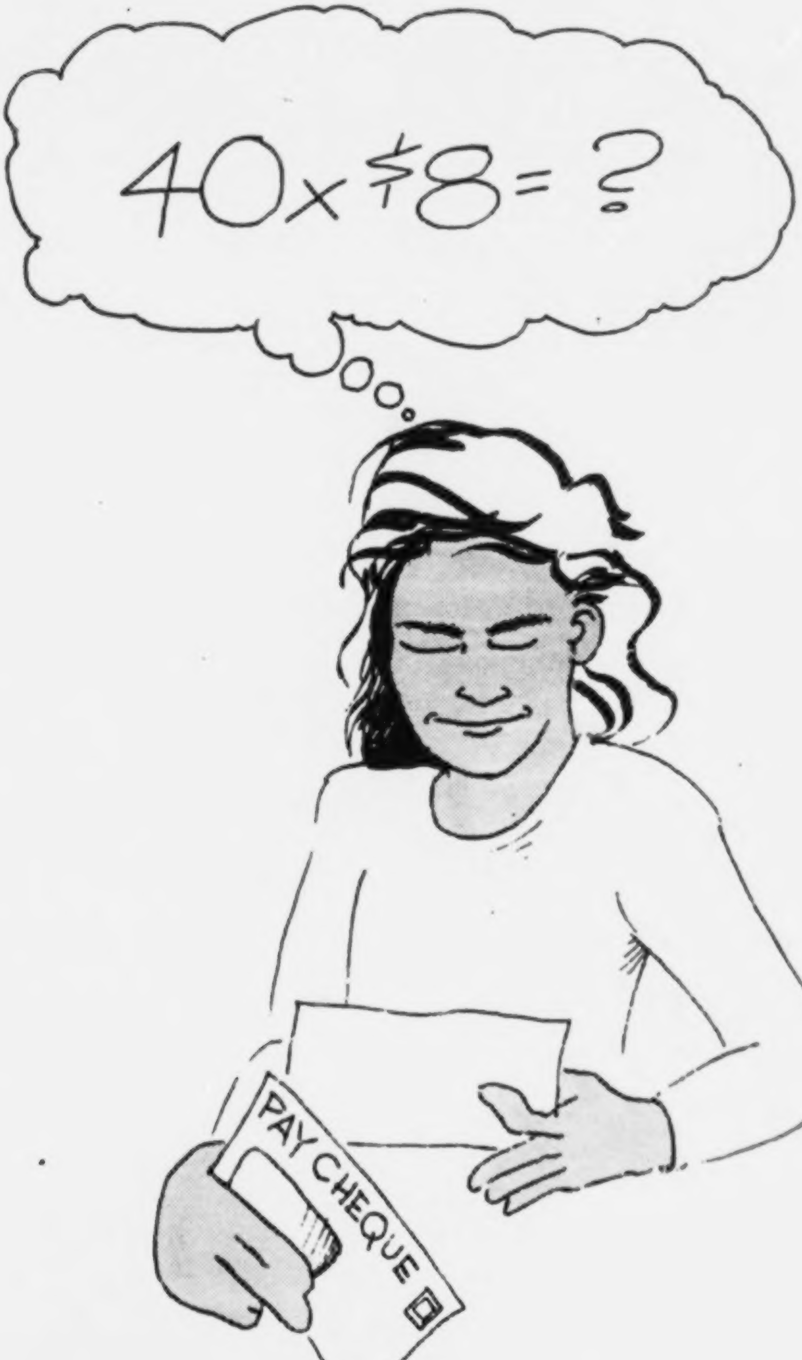
Ricardo has an appointment with an employment counsellor. He needs to tell him how many jobs he applied for last week. He saw 5 jobs in the newspaper. He heard about 3 jobs from friends. He saw 2 jobs advertised on the street. In total how many jobs did he apply for?

A monthly Metropass seems expensive but it may be cheaper than buying 10 tickets every week. Joe works 3 days a week. He uses the bus to go shopping once a week. He also visits friends once or twice a week. Does he use more than ten tokens a week? Should he buy a Metropass?

Do you have problems in your everyday life that require adding and subtracting to solve? Talk about them and use the problem-solving steps to work on solving them.

RONCESVALLES 504

More Multiplying and Dividing


40x$8=?
PAY CHEQUE

Notes for More Multiplying and Dividing

- *This section is for people who have trouble remembering multiplication tables and division facts.*

- *This section includes the folllowing.*
    - *multiplication patterns that include times tables from 1x10 to 10x10*
    - *division patterns that include 1 to 10 as the divisor and 10 to 100 as the quotient*
    - *practice in solving word problems involving multiplication and division*

- *The skills presented in this section are essential for further learning. As much as possible, the number patterns/facts should be committed to memory so that they become automatic. Games and other interesting activities can be created to help the learner practise the operational skills.*

- *As often as possible, the abstract skills should be related to everyday situations. Facilitators and learners are encouraged to create their own word problems to relate the mathematical skills to everyday life. Take care that the word problems involve calculations that are within the scope of the learners' present mathematical understanding.*

- *Learners from outside Canada may have different ways of writing times tables. Encourage them in whatever way they best relate to the material.*

More About Multiplying and Dividing

You are getting used to multiplying and dividing. You understand when to multiply and when to divide. You are able to talk about your decisions and explain them. Now you can go on to multiply and divide bigger numbers.

Consider this Problem

Sandra works part–time as a cleaner. She worked one night last week. She wants to calculate her pay for the night. Her pay is $9 an hour. She worked for 8 hours. How much pay should she get? To find out, she can multiply her hourly pay times the number of hours that she worked.

$$9 \times 8 = ?$$

Another night, Sandra was paid $63. She wants to figure out how many hours she got paid for. To find this out, she can divide the total pay by the hourly rate of pay.

$$63 \div 9 = ?$$

This gives her the number of hours she got paid for.

If you are not sure how to multiply and divide these numbers, and you would like help, continue with this section.

Multiplying and Dividing by 1

Fill in the answers.

1 x 1 =

2 x 1 =

3 x 1 =

4 x 1 =

5 x 1 =

6 x 1 =

7 x 1 =

8 x 1 =

9 x 1 =

10 x 1 =

1 ÷ 1 =

2 ÷ 1 =

3 ÷ 1 =

4 ÷ 1 =

5 ÷ 1 =

6 ÷ 1 =

7 ÷ 1 =

8 ÷ 1 =

9 ÷ 1 =

10 ÷ 1 =

Multiplying and Dividing by 2

Fill in the answers.

1 x 2 =

2 x 2 =

3 x 2 =

4 x 2 =

5 x 2 =

6 x 2 =

7 x 2 =

8 x 2 =

9 x 2 =

10 x 2 =

2 ÷ 2 =

4 ÷ 2 =

6 ÷ 2 =

8 ÷ 2 =

10 ÷ 2 =

12 ÷ 2 =

14 ÷ 2 =

16 ÷ 2 =

18 ÷ 2 =

20 ÷ 2 =

Multiplying and Dividing by 3

Fill in the answers.

1 x 3 =

2 x 3 =

3 x 3 =

4 x 3 =

5 x 3 =

6 x 3 =

7 x 3 =

8 x 3 =

9 x 3 =

10 x 3 =

3 ÷ 3 =

6 ÷ 3 =

9 ÷ 3 =

12 ÷ 3 =

15 ÷ 3 =

18 ÷ 3 =

21 ÷ 3 =

24 ÷ 3 =

27 ÷ 3 =

30 ÷ 3 =

Multiplying and Dividing by 4

Fill in the answers.

1 x 4 =

2 x 4 =

3 x 4 =

4 x 4 =

5 x 4 =

6 x 4 =

7 x 4 =

8 x 4 =

9 x 4 =

10 x 4 =

4 ÷ 4 =

8 ÷ 4 =

12 ÷ 4 =

16 ÷ 4 =

20 ÷ 4 =

24 ÷ 4 =

28 ÷ 4 =

32 ÷ 4 =

36 ÷ 4 =

40 ÷ 4 =

Multiplying and Dividing by 5

Fill in the answers.

1 x 5 =

2 x 5 =

3 x 5 =

4 x 5 =

5 x 5 =

6 x 5 =

7 x 5 =

8 x 5 =

9 x 5 =

10 x 5 =

5 ÷ 1 =

10 ÷ 5 =

15 ÷ 5 =

20 ÷ 5 =

25 ÷ 5 =

30 ÷ 5 =

35 ÷ 5 =

40 ÷ 5 =

45 ÷ 5 =

50 ÷ 5 =

Multiplying and Dividing by 6

Fill in the answers.

1 x 6 =	6 ÷ 6 =
2 x 6 =	12 ÷ 6 =
3 x 6 =	18 ÷ 6 =
4 x 6 =	24 ÷ 6 =
5 x 6 =	30 ÷ 6 =
6 x 6 =	36 ÷ 6 =
7 x 6 =	42 ÷ 6 =
8 x 6 =	48 ÷ 6 =
9 x 6 =	54 ÷ 6 =
10 x 6 =	60 ÷ 6 =

Multiplying and Dividing by 7

Fill in the answers.

1 x 7 =

2 x 7 =

3 x 7 =

4 x 7 =

5 x 7 =

6 x 7 =

7 x 7 =

8 x 7 =

9 x 7 =

10 x 7 =

7 ÷ 7 =

14 ÷ 7 =

21 ÷ 7 =

28 ÷ 7 =

35 ÷ 7 =

42 ÷ 7 =

49 ÷ 7 =

56 ÷ 7 =

63 ÷ 7 =

70 ÷ 7 =

Multiplying and Dividing by 8

Fill in the answers.

1 x 8 =

2 x 8 =

3 x 8 =

4 x 8 =

5 x 8 =

6 x 8 =

7 x 8 =

8 x 8 =

9 x 8 =

10 x 8 =

8 ÷ 8 =

16 ÷ 8 =

24 ÷ 8 =

32 ÷ 8 =

40 ÷ 8 =

48 ÷ 8 =

56 ÷ 8 =

64 ÷ 8 =

72 ÷ 8 =

80 ÷ 8 =

Multiplying and Dividing by 9

Fill in the answers.

1 x 9 =

2 x 9 =

3 x 9 =

4 x 9 =

5 x 9 =

6 x 9 =

7 x 9 =

8 x 9 =

9 x 9 =

10 x 9 =

9 ÷ 9 =

18 ÷ 9 =

27 ÷ 9 =

36 ÷ 9 =

45 ÷ 9 =

54 ÷ 9 =

63 ÷ 9 =

72 ÷ 9 =

81 ÷ 9 =

90 ÷ 9 =

Multiplying and Dividing by 10

Fill in the answers.

1 x 10 =

2 x 10 =

3 x 10 =

4 x 10 =

5 x 10 =

6 x 10 =

7 x 10 =

8 x 10 =

9 x 10 =

10 x 10 =

10 ÷ 10 =

20 ÷ 10 =

30 ÷ 10 =

40 ÷ 10 =

50 ÷ 10 =

60 ÷ 10 =

70 ÷ 10 =

80 ÷ 10 =

90 ÷ 10 =

100 ÷ 10 =

Patterns in Multiplying

Multiples of 2

2 4 6 8 10

12 14 16 18 20

This is like the pattern when counting by twos.

Fill in the numbers missing from these patterns.

Multiples of 3

3 6 __ 12 15

18 __ 24 27 __

Multiples of 4

4 8 12 __ 20

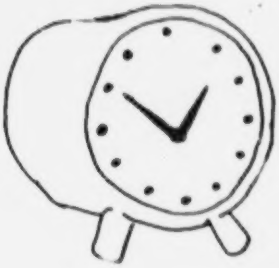
24 28 __ 36 40

Multiples of 5

5 10 15 20 25

30 35 40 45 50

We use this pattern on clocks.



Multiples of 6

6 __ 18 24 __

36 42 __ 54 60

Multiples of 7

7 14 __ 28 35

__ 49 56 __ 70

Multiples of 8

8 16 24 __ 40

__ 56 64 72 __

Multiples of 9

9 __ 27 36 __

54 63 __ 81 90

Multiples of 10

10 20 __ 40 50

__ 70 80 __ 100

Multiplying Practice

$$\begin{array}{rrrrr} 5 & 6 & 1 & 7 & 3 \\ \times\ 5 & \times\ 7 & \times\ 4 & \times\ 9 & \times\ 7 \\ \hline \end{array}$$

$$\begin{array}{rrrrr} 4 & 6 & 1 & 5 & 8 \\ \times\ 5 & \times\ 9 & \times\ 2 & \times\ 0 & \times\ 4 \\ \hline \end{array}$$

$$\begin{array}{rrrrr} 5 & 4 & 7 & 9 & 6 \\ \times\ 8 & \times\ 0 & \times\ 7 & \times\ 1 & \times\ 6 \\ \hline \end{array}$$

$$\begin{array}{rrrrr} 9 & 8 & 5 & 8 & 8 \\ \times\ 4 & \times\ 2 & \times\ 1 & \times\ 7 & \times\ 6 \\ \hline \end{array}$$

Checking Division

Remember, multiplying and dividing undo each other. To check the solution to a dividing problem, you multiply. For example,

if $\begin{array}{r} 5 \\ 4\overline{)\ 20} \end{array}$ then 5 x 4 = 20.

Here are some division problems. Check to see if they are correct. Follow the example.

$\begin{array}{r} 8 \\ 3\overline{)\ 24} \end{array} \longrightarrow 8 \times 3 = 24$

$\begin{array}{r} 5 \\ 4\overline{)\ 20} \end{array} \longrightarrow 5 \times 4 =$

$\begin{array}{r} 5 \\ 5\overline{)\ 25} \end{array} \longrightarrow 5 \times 5 =$

$\begin{array}{r} 3 \\ 6\overline{)\ 18} \end{array} \longrightarrow 3 \times 6 =$

Use multiplication facts to help divide. Follow the example.

$$3 \times 8 = 24 \longrightarrow 8\overline{)24}$$

$$7 \times 5 = 35 \longrightarrow 5\overline{)35}$$

$$6 \times 7 = 42 \longrightarrow 7\overline{)42}$$

$$10 \times 5 = 50 \longrightarrow 5\overline{)50}$$

$$9 \times 3 = 27 \longrightarrow 3\overline{)27}$$

$$8 \times 4 = 32 \longrightarrow 4\overline{)32}$$

$5 \times 8 = 40 \longrightarrow 8\overline{)40}$

$6 \times 9 = 54 \longrightarrow 9\overline{)54}$

$7 \times 8 = 56 \longrightarrow 8\overline{)56}$

$4 \times 9 = 36 \longrightarrow 9\overline{)36}$

$9 \times 2 = 18 \longrightarrow 2\overline{)18}$

$4 \times 7 = 28 \longrightarrow 7\overline{)28}$

Solving Problems

To solve the problems on the following pages, you will need to decide whether to multiply or divide. Read the problems carefully.

Remember the 4 steps for problem-solving.

1. Make sure you understand the problem. Read it again or ask for help.

2. Ask yourself what you have to do to solve the problem. Do you need to add, subtract, multiply or divide?

3. Find the numbers that you need to solve the problem.

4. Write the problem using numbers and signs and then solve it.

Try solving these problems yourself. Follow the steps.

Clifford works at temporary jobs that he gets through a job agency. One day he moved furniture for 8 hours. He got paid $48. What was his hourly pay? Did he make more or less than the minimum wage?

While on unemployment insurance, Nga needs to show that she is looking for work. Her counsellor told her to make 20 job contacts a month. If she looks for work 10 days a month, how many contacts does she need to make on each of those days?

Haviva has four grown up children. Each of her children has two children of their own. How many grandchildren does Haviva have?

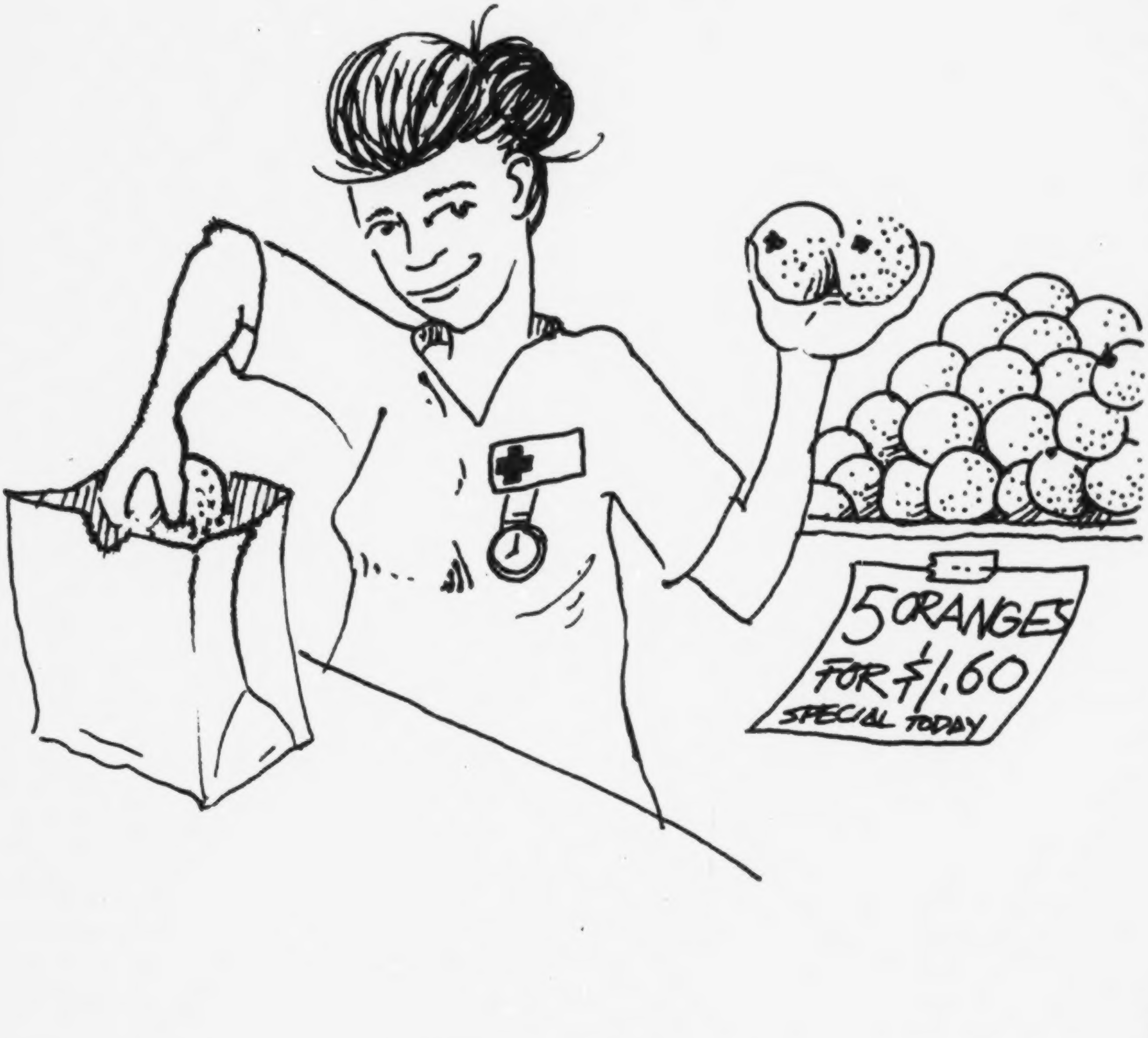
Lincoln lives in a small apartment building. He has been asked to deliver notices about a community meeting to all the apartments in his building. There are eight apartments on each floor and there are six floors. How many notices does she need?

Frank uses 2 TTC tickets to get to work and back from Monday to Friday. He does not use tickets on the weekend. How many tickets does he use every month?

Farsad works at a restaurant. He has to set out twenty-four chairs and six tables on the patio. How many chairs should go to each table?

Shirlon has six days to finish making eight dresses for a wedding. She will work eight hours a day. How much time should she spend on each dress?

Do you have problems in your everyday life that require multiplying and dividing to solve? Discuss some of these problems with your tutor or group and try to solve them together.


5 ORANGES
FOR $1.60
SPECIAL TODAY

Working With Bigger Numbers

Notes for Working with Bigger Numbers

- *This section is for people who are not familiar with regrouping (carrying and borrowing) and long division.*

- *This section includes the following:*
  - *adding two-digit numbers without and with carrying*
  - *subtracting two-digit numbers without and with borrowing*
  - *multiplying two-digit numbers by one-digit numbers without and with carrying*
  - *dividing three-digit numbers by one-digit numbers using long division*
  - *solving related word problems*

- *This section uses one theme - buying furniture - to introduce and explain these mathematical skills. These skills require a great deal of practice. This section does not include pages of mechanical practice, because such exercises are readily available in most numeracy and math books. Learners and facilitators may also take the opportunity to create their own exercises.*

- *Relating the abstract concepts and skills to concrete objects is essential. This section uses money and place value charts to explain these concepts. Before starting this section, the facilitator should be sure to have loonies, ten-dollar bills and hundred-dollar bills or facsimiles. Learner should have their own place value charts and money supply.*

- *There are many ways to write calculations. Keep in mind that the way we learn how to write and calculate problems in Canada is only one way. Do not discourage students from showing borrowing, long division, or any calculation in a way different from what we do in this book. This is an opportunity to learn from learners.*

- *It is important to allow time for a full discussion of the concepts for a thorough understanding at each stage.*

Working With Bigger Numbers

Consider this problem. You need a new kitchen table and chairs. A furniture catalogue arrives at your door. In the catalogue, you see some furniture that you like, and it is reasonably priced.

You may want to figure out the cost of different combinations of chairs and tables. You will need to add.

You may want to compare the costs of different tables and chairs. You will need to subtract.

You may want to figure out the cost of two, three, four, five, or six chairs. You will need to multiply.

You may want to figure out how many weeks it will take to save enough money to buy the furniture. You will need to divide.

Working on these questions, you find that you need to write down several numbers and that some of the numbers have two digits. How do you work with these numbers?

If you are not sure, continue with this section to find out how to work with bigger numbers.

Calculating Totals

In the furniture catalogue, you see a small table for $37 and a folding chair that you like for $21.

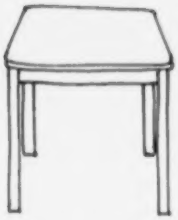
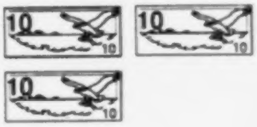
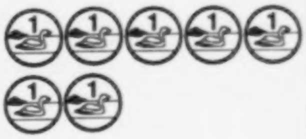
What is the cost of the table and two chairs?

You need to add three numbers.

table	37
chair	21
+ chair	21

The next page shows this total using a money chart. Try this yourself using bills and loonies.

Showing Totals Using Money

		tens	ones
	37		
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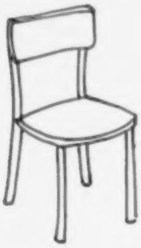
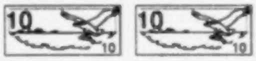
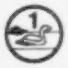
	21		
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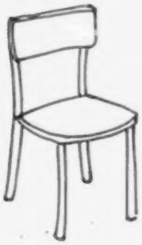
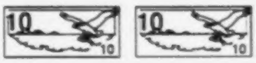
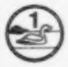
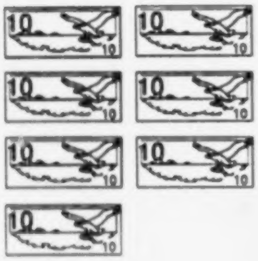
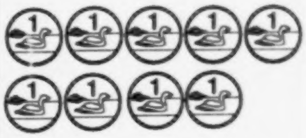
	21		
Total	79		

Adding in Columns

$$\begin{array}{r} 52 \\ +\ 37 \\ \hline \end{array} \qquad \begin{array}{r} 21 \\ 21 \\ 21 \\ +\ 21 \\ \hline \end{array} \qquad \begin{array}{r} 37 \\ +\ 61 \\ \hline \end{array}$$

$$\begin{array}{r} 42 \\ 36 \\ +\ 11 \\ \hline \end{array} \qquad \begin{array}{r} 95 \\ +\ 12 \\ \hline \end{array} \qquad \begin{array}{r} 42 \\ 42 \\ +\ 42 \\ \hline \end{array}$$

Notice that you add the columns separately and that you start from the right. Make sure that you are comfortable adding in columns before you continue. If you are not, try working on practice exercises from other books.

Here are the prices for a table and two chairs.

round table	$45
set of two wooden chairs	$48

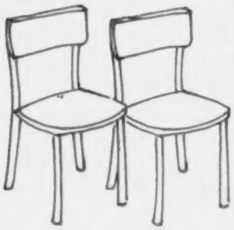
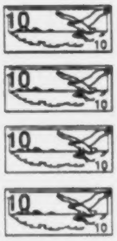
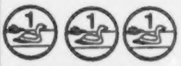
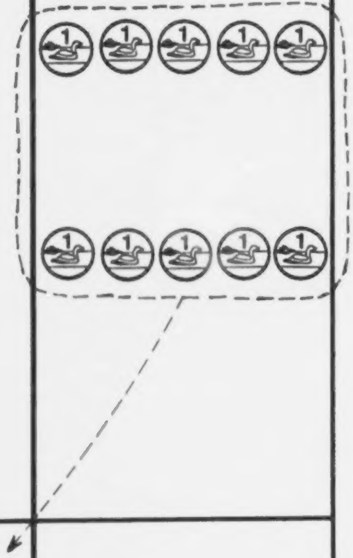
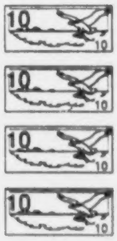
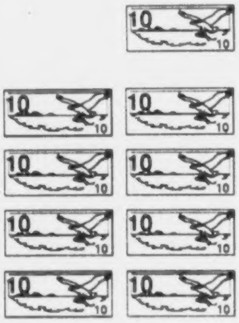
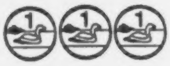
What is the total cost of the table and the chairs?

You need to add.

chairs	48
round table	+45
The total cost is	$93

The next page shows this result using a money chart. Try this yourself using bills and loonies.

Showing Totals Using Money

		tens	ones
	48		
	+		
	45		
Total	93		

When adding we get 13 ones.
13 ones is the same as 1 ten and 3 ones.
We then add this ten to the other tens.

Showing Totals Using Numbers

Notice that 8 + 5 = 13 ⟶ 1 ten and 3 ones.

When adding, put this ten above the other tens, like this

$$\begin{array}{r} {\scriptstyle 1} \\ 48 \\ +45 \\ \hline 3 \end{array}$$

Now add 1 + 4 + 4 = 9 ⟶ 9 tens.

$$\begin{array}{r} {\scriptstyle 1} \\ 48 \\ +45 \\ \hline 93 \end{array}$$

The total is 93

When you hold a number at the top of the tens column to add to the other numbers in that column, it is called **carrying**. You will be doing more carrying in the problems to come.

Here are the prices for another table and chair.

square white table	$79
white chair	$59

What is the cost of the square white table and two white chairs?

You need to add three numbers.
Copy the numbers here.

Go on to the next page to finish this problem.

Showing Totals Using Numbers

First add the 9's.

9 + 9 + 9 = 27 ⟶ 2 tens and 7 ones

Put the 2 above the other tens.

$$\begin{array}{r} {}^{2} \\ 79 \\ 59 \\ +59 \\ \hline 7 \end{array}$$

Now add

2 + 7 + 5 + 5 = 19 ⟶ 19 tens

⟶ 1 hundred and 9 tens

The finished question looks like this.

$$\begin{array}{r} {}^{2} \\ 79 \\ 59 \\ +59 \\ \hline 197 \end{array}$$

So the total cost of the table and chairs is $ ______

Make up your own problems.

Figure out the cost of different combinations of tables and chairs using these prices.

small table	$37
folding chair	$21
round table	$45
wooden chair	$24
square white table	$79
white chair	$59

For example, add

- the cost of one white chair and the round table
- the cost of one wooden chair and the small table
- the cost of any table and any two chairs

Try your own combinations! If you need more practice, look for exercises in other books.

Calculating Differences

Look at these furniture prices.

wooden chair	$42
white chair	$59

What is the difference in price between the wooden chair and the white chair?

You need to subtract.

$$\begin{array}{rl} 59 & \text{white chair} \\ \underline{-42} & \text{wooden chair} \end{array}$$

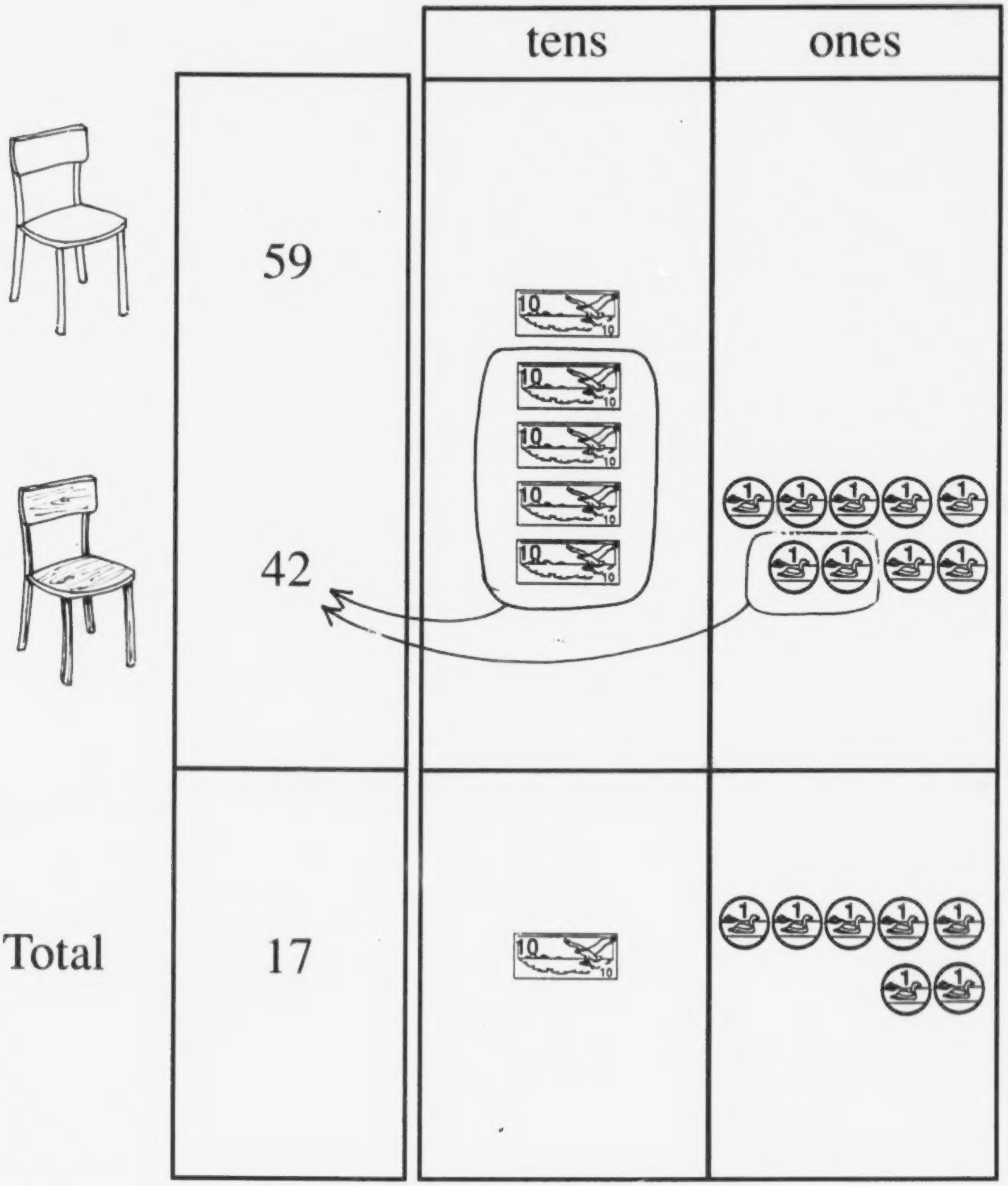
Notice that you write the bigger number on top.

The difference in price between the two chairs is

$ ______

The next page shows this result using a money chart. Try this yourself using bills and loonies.

Showing Differences Using Money


tens
ones
59
42
Total
17
10

Subtracting in Columns

$$\begin{array}{r} 56 \\ -31 \\ \hline \end{array} \qquad \begin{array}{r} 89 \\ -52 \\ \hline \end{array} \qquad \begin{array}{r} 75 \\ -44 \\ \hline \end{array} \qquad \begin{array}{r} 48 \\ -27 \\ \hline \end{array}$$

$$\begin{array}{r} 37 \\ -21 \\ \hline \end{array} \qquad \begin{array}{r} 68 \\ -58 \\ \hline \end{array} \qquad \begin{array}{r} 99 \\ -80 \\ \hline \end{array} \qquad \begin{array}{r} 85 \\ -53 \\ \hline \end{array}$$

$$\begin{array}{r} 27 \\ -15 \\ \hline \end{array} \qquad \begin{array}{r} 59 \\ -42 \\ \hline \end{array} \qquad \begin{array}{r} 84 \\ -24 \\ \hline \end{array} \qquad \begin{array}{r} 77 \\ -50 \\ \hline \end{array}$$

Notice that you subtract each column separately and that you start from the right. Make sure that you are comfortable subtracting in columns before you continue. If you are not, try working on practice exercises from other books.

Here are the prices of two tables.

round wooden table	$98
square white table	$79

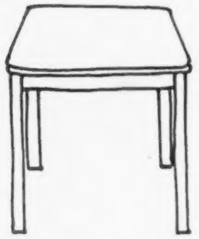
How much more expensive is the round table?

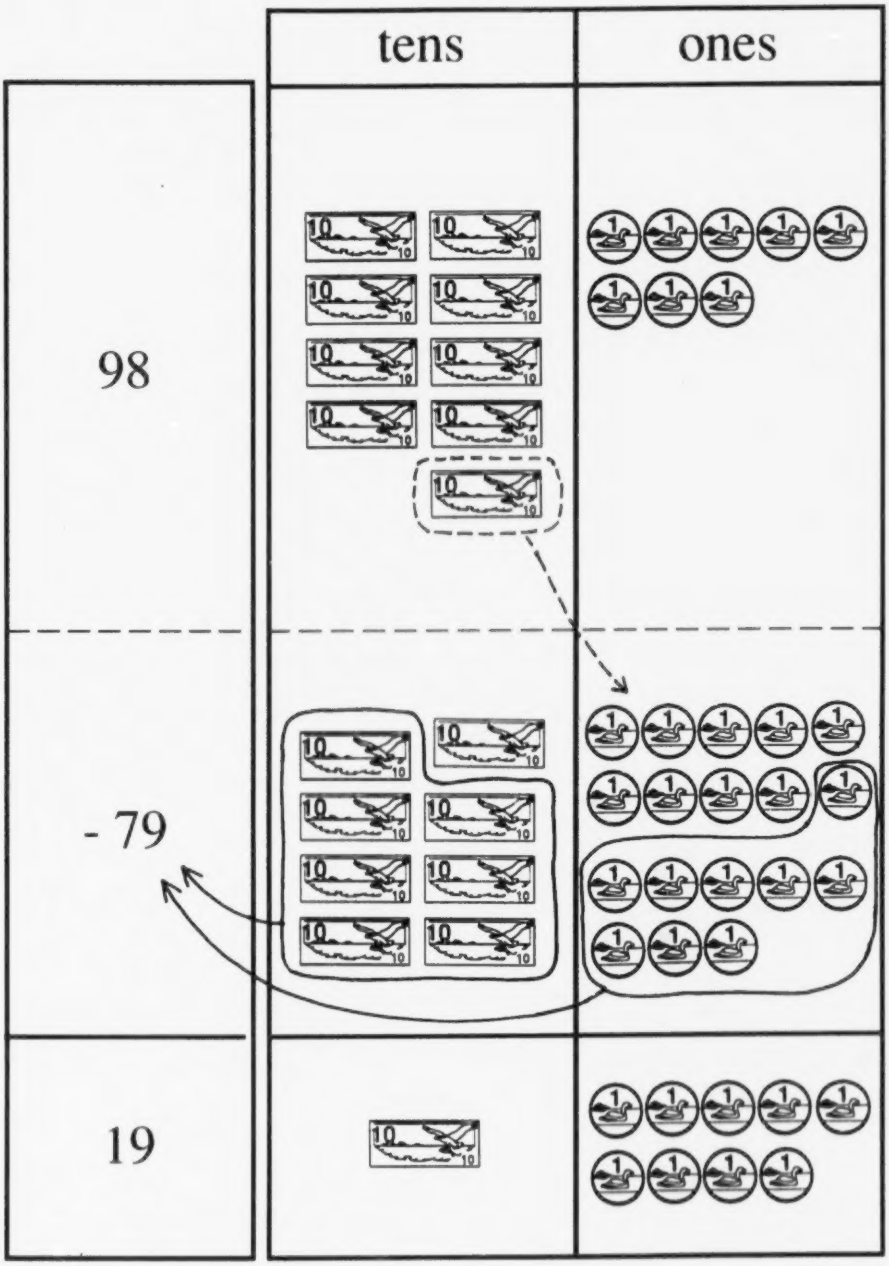
To find out, you need to subtract.

$$\begin{array}{r} 98 \\ -79 \\ \hline 19 \end{array}$$

The next page shows this result using a money chart. Try this yourself using bills and loonies.

Showing Differences Using Money





We cannot take 9 away from 8. To help us subtract, we change 1 ten to 10 ones. This gives us 18 ones. Then we take 9 away from 18.

Showing Differences Using Numbers

Move 1 ten
to the ones column.
This leaves 8 tens
and 18 ones.

$$\begin{array}{r} {}^{8}\cancel{9}{}^{1}8 \\ -79 \end{array}$$

Notice that 18 − 9 = 9 ⟶ 9 ones

$$\begin{array}{r} {}^{8}\cancel{9}{}^{1}8 \\ -79 \\ \hline 9 \end{array}$$

Then subtract 8 − 7 = 1 ⟶ 1 ten

$$\begin{array}{r} {}^{8}\cancel{9}{}^{1}8 \\ -79 \\ \hline 19 \end{array}$$

The difference in price between the two tables is

$ _______

When you move a number from one column to another column to help with subtraction, it is called **borrowing**. You will be doing more borrowing in the problems to come.

Make up your own problems.

Find the difference in price between various chairs and tables using these prices.

small table	$37
folding chair	$21
round table	$45
wooden chair	$24
square white table	$79
white chair	$59

For example, find the difference in price

* between the folding chair and the white chair

* between the small table and the round table

Try your own combinations! If you need more practice, look for exercises in other books.

Calculating Multiples

Sometimes it is faster to multiply than to add. When figuring out the cost of two, three, four, or any number of items, you can multiply.

The cost of one wooden chair is $42.
What do 2 of these chairs cost?
Multiply the cost of the chair by 2.

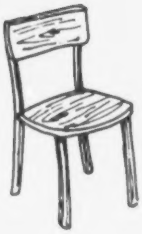
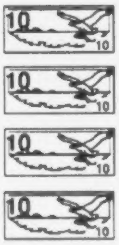
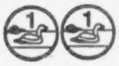
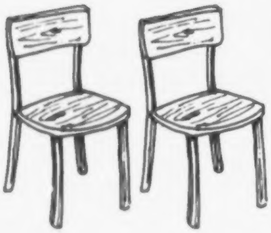
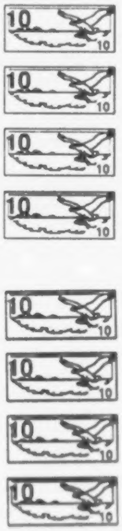
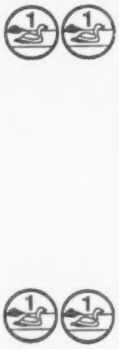
one chair	42
	x2
two chairs	84

Notice that you need to multiply each column separately.

First multiply 2 x 2 = 4 → 4 ones
Then multiply 2 x 4 = 8 → 8 tens

So, the total cost is $84.
The next page shows the result using a money chart. Try this yourself using bills and loonies.

Showing Multiplication Using Money

		tens	ones
	42		
	x 2		
	84		

Notice that when we double $42
we get 8 tens and 4 ones.

How much does it cost to buy three chairs?

One chair costs $42.

Multiply the cost of one chair by 3.

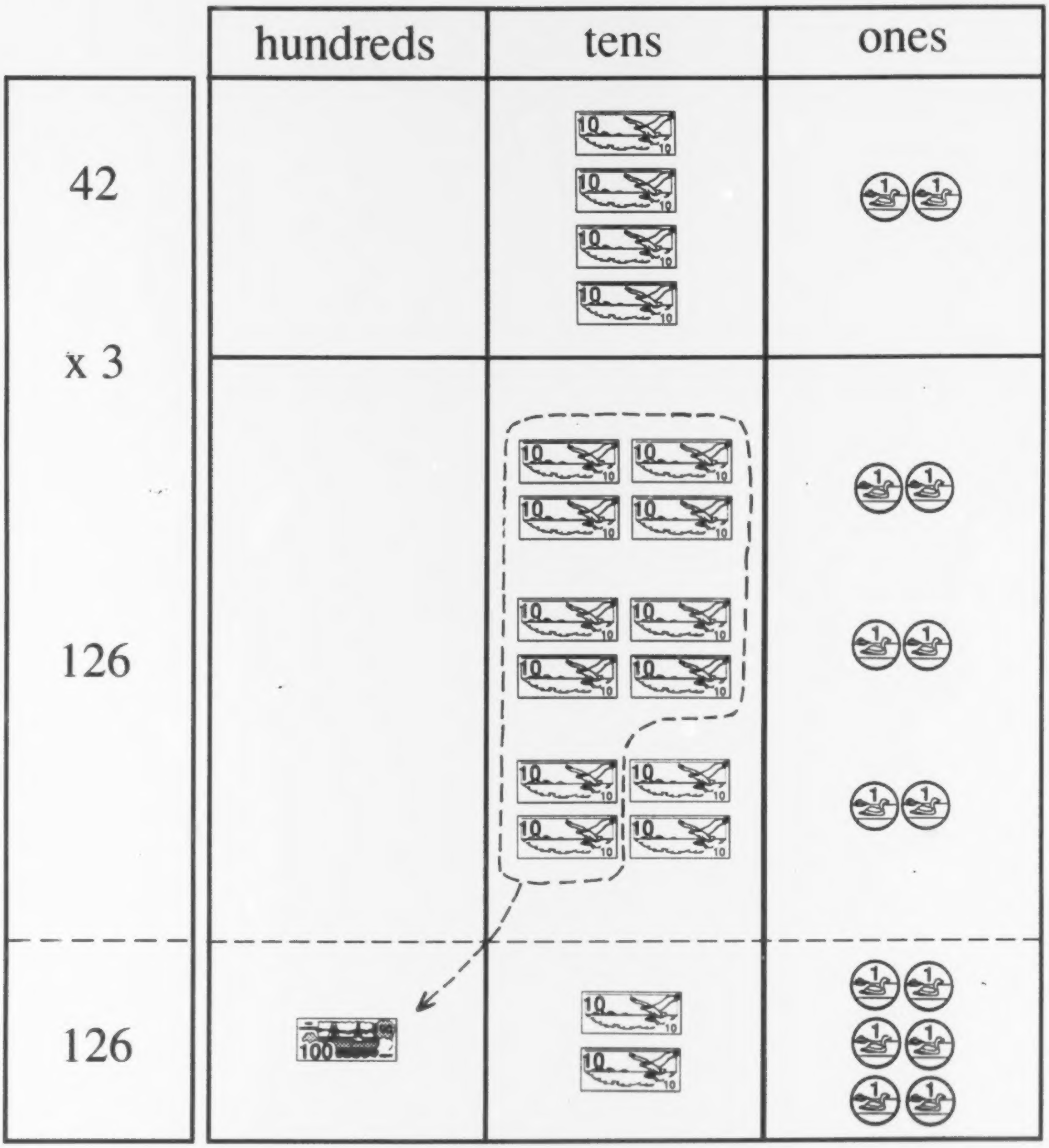
$$\begin{array}{lr} \text{one chair} & 42 \\ & \underline{\times\ 3} \\ \text{three chairs} & \end{array}$$

First multiply 3 x 2 = 6 ⟶ 6 ones
Then multiply 3 x 4 = 12 ⟶ 12 tens
⟶ 1 hundred and 2 tens

The cost of the three chairs is $ ________

The next page shows the result using a money chart. Try this yourself using bills and loonies.

Showing Multiplication Using Money


hundreds
tens
ones
42
x 3
126
126
10
1
100

Notice that when we triple $42,

we get 1 hundred, 2 tens and 6 ones.

How much does it cost to buy four wooden chairs?

Multiply the cost of one chair by 4.

one chair 42
x 4
four chairs

Remember that you multiply twice.

First multiply 4 x 2 = 8 ⟶ 8 ones

Then multiply 4 x 4 = 16 ⟶ 16 tens
⟶ 1 hundred and 6 tens

The cost of four chairs is $ ________

Multiplying in Columns

$$\begin{array}{r} 53 \\ \times\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 21 \\ \times 4 \\ \hline \end{array} \qquad \begin{array}{r} 40 \\ \times 5 \\ \hline \end{array} \qquad \begin{array}{r} 64 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 33 \\ \times 3 \\ \hline \end{array}$$

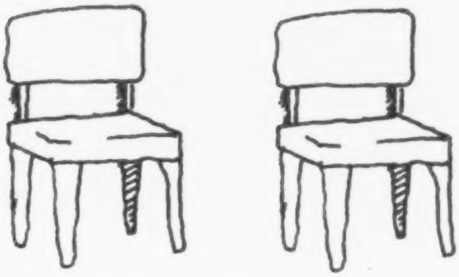
$$\begin{array}{r} 60 \\ \times\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 22 \\ \times 4 \\ \hline \end{array} \qquad \begin{array}{r} 52 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 23 \\ \times 3 \\ \hline \end{array} \qquad \begin{array}{r} 34 \\ \times 2 \\ \hline \end{array}$$

Notice that you multiply the top number by the bottom number and that you always start from the right. Make sure that you are comfortable multiplying in columns before you continue. If you are not, try working on practice exercises from other books.

What is the cost of two white chairs if one costs $48?

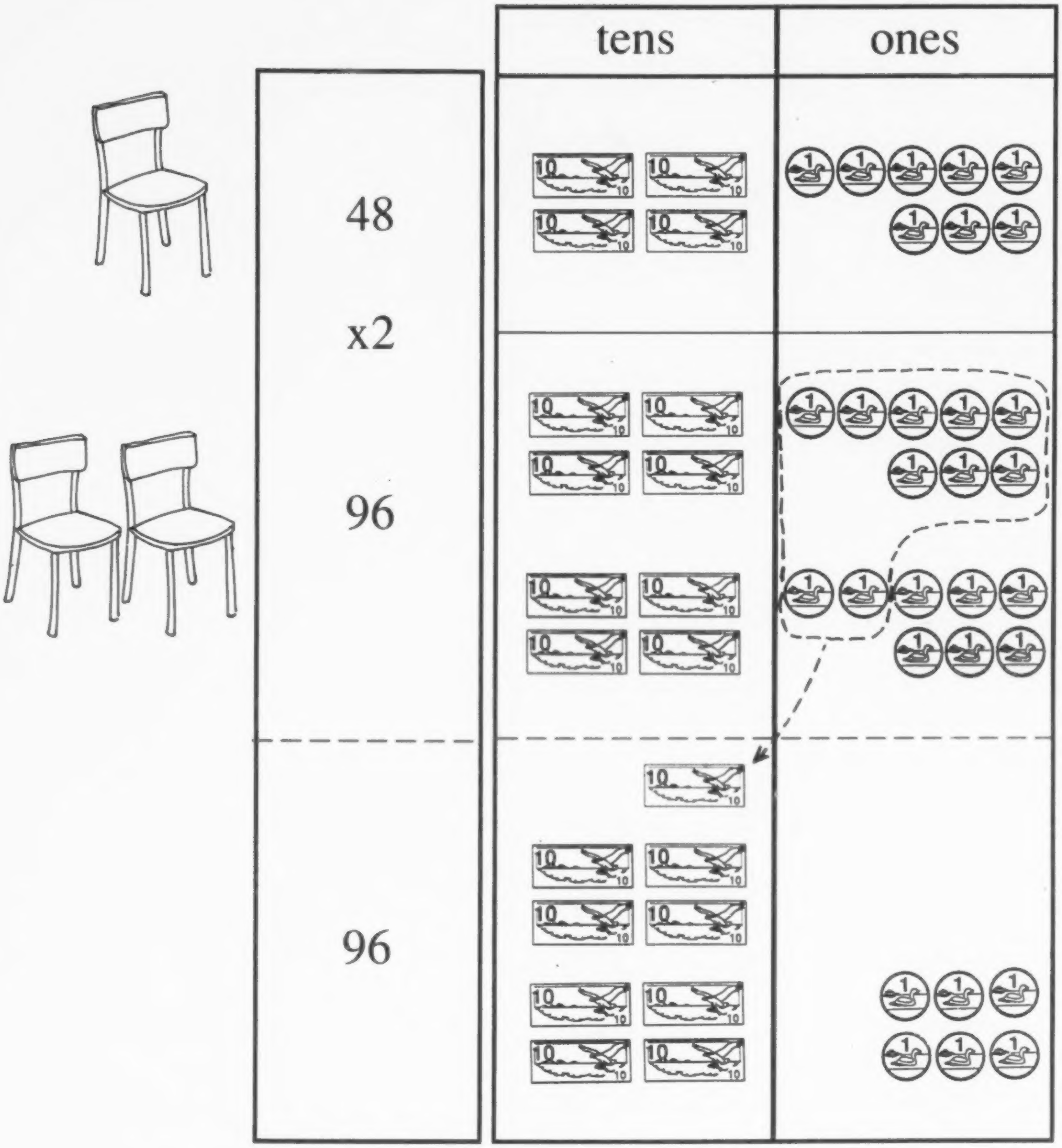
Multiply by 2.

one chair	48
	x 2
two chairs	96



The next page shows this result using a money chart. Try this yourself using bills and loonies.

Showing Multiplication Using Money


tens
ones
48
x2
96
96

Notice that when we double $48

we get 9 tens and 6 ones.

Showing Multiplication Using Numbers

First multiply
2 x 8 = 16 ⟶ 1 ten and 6 ones
Hold this 1 ten
over the tens column.

$$\begin{array}{r} 1 \\ 48 \\ \underline{\times 2} \\ 6 \end{array}$$

This is like the carrying we did before.

Then multiply
2 x 4 = 8 ⟶ 8 tens
Remember the 1 ten that you carried.
Add 8 + 1 = 9 ⟶ 9 tens

$$\begin{array}{r} 1 \\ 48 \\ \underline{\times\ 2} \\ 96 \end{array}$$

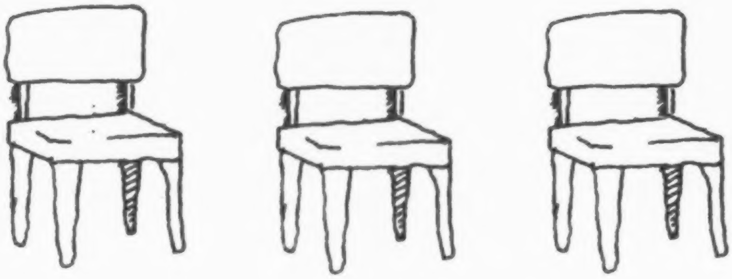
So, two white chairs cost $ ________

What do three white chairs cost ?

Multiply the cost of one chair by 3.

one chair	48
	x 3
three chairs	144

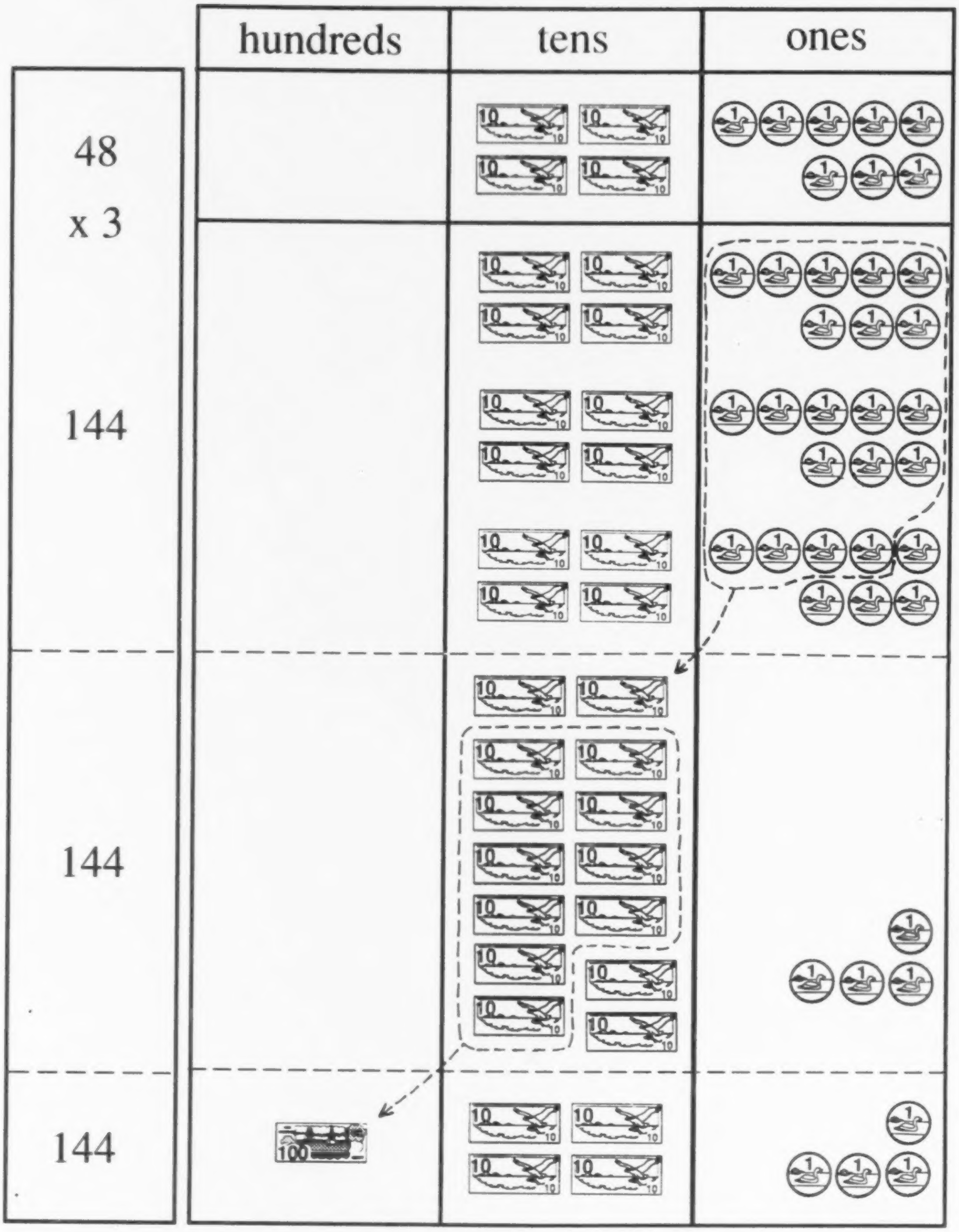
The cost of three chairs is $144.



The next page shows this result using a money chart. Notice that when we triple $48 we get 1 hundred, 4 tens, and 4 ones.

Try this yourself using bills and loonies.

Showing Multiplication Using Money


hundreds
tens
ones
48
x 3
144
144
144

Showing Totals Using Numbers

First multiply
3 x 8 = 24 → 2 tens and 4 ones

Hold the 2
over the tens column.

$$\begin{array}{r} 2 \\ 48 \\ \times\ 3 \\ \hline 4 \end{array}$$

Then multiply
3 x 4 = 12 → 12 tens.

Remember the 2 tens.
Add 12 + 2 = 14
→ 14 tens
→ 1 hundred and 4 tens

$$\begin{array}{r} 2 \\ 48 \\ \times\ 3 \\ \hline 144 \end{array}$$

So, three white chairs cost $ ________

What do four white chairs cost?

One chair costs $48. Fill in the numbers and work out the solution.

$$\begin{array}{lr} \text{cost of one chair} \longrightarrow & \\ & \underline{\times\ 4} \\ \text{total cost} \longrightarrow & \end{array}$$

Does your solution look like this?

$$\begin{array}{r} {}^{3} \\ 48 \\ \underline{\times\ 4} \\ 192 \end{array}$$

So the cost of four white chairs is $192.

Make up your own problems.

Figure out the cost of different numbers of chairs using these prices.

folding chair	$21
wooden chair	$24
white chair	$59

For example, calculate

- the cost of two white chairs
- the cost of three wooden chairs
- the cost of four folding chairs

Try your own combinations! If you need more practice, look for exercises in other books.

Doing Long Division

You decide to buy the round table that costs $98. You need to know how much to save each week in order to buy the table in time for a party that is seven weeks away.

How much will you put away each week to save the $98 for the table? To figure it out, you will need to divide.

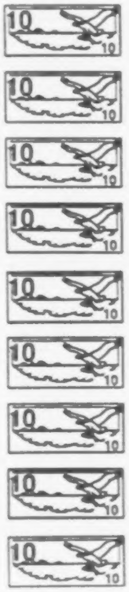
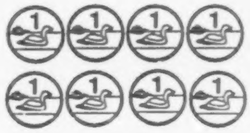
The problem looks like this. $7\overline{)\,98}$

The solution looks like this.
The solution takes
many steps.

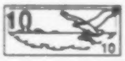
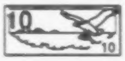
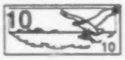
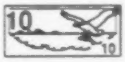
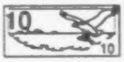
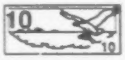
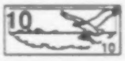
$$\begin{array}{r} 14 \\ 7\overline{)\,98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

Using money, we can divide the $98 into seven weeks with the method shown on the next page. Try this yourself using bills and loonies.

Showing Division Using Money

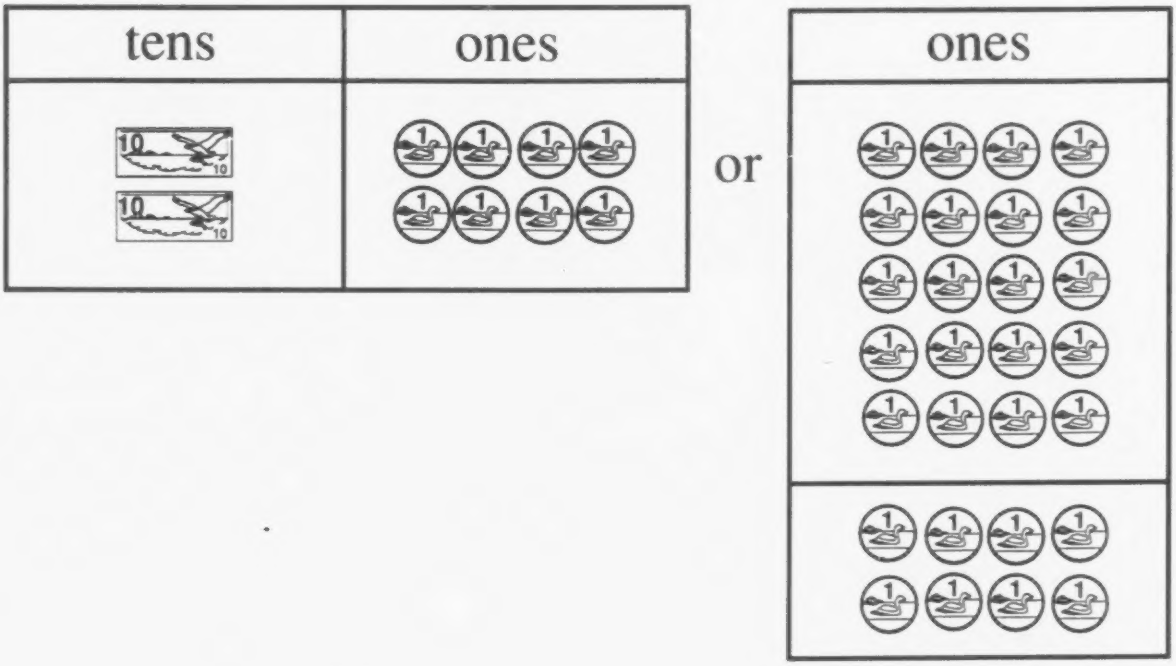
tens	ones
	

From the $98, each week gets **1 ten**.

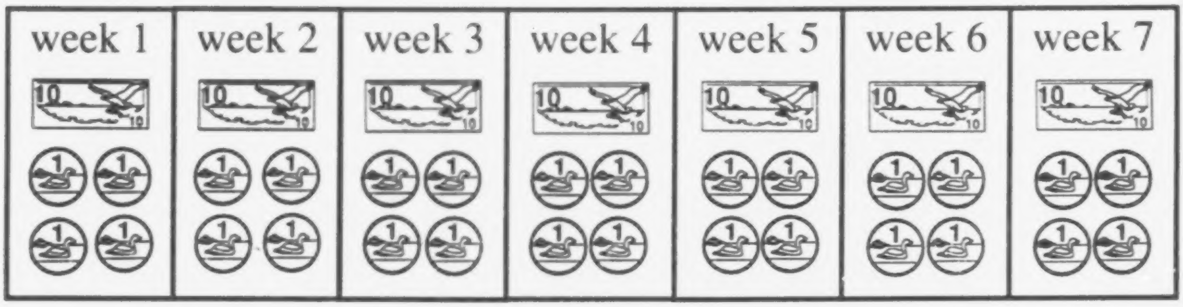
week 1	week 2	week 3	week 4	week 5	week 6	week 7
						

Now we have used up 7 tens.

This leaves 2 tens and 8 ones, or $28.


tens
ones
or
ones

From the $28, each week now gets **4 ones**.


week 1
week 2
week 3
week 4
week 5
week 6
week 7

So each week you will save $14.

With money, we see above how $98 can be divided into 7 groups of $14.

Showing Division Using Numbers

Follow these steps.

1. How many times will

   7 **divide** into 9 → 1

$$\begin{array}{rl} & 1 \\ 7 & \overline{)\,98} \end{array}$$

2. **Multiply**

   1 x 7 = 7

$$\begin{array}{rl} & 1 \\ 7 & \overline{)\,98} \\ & 7 \end{array}$$

3. **Subtract**

   9 - 7 = 2

$$\begin{array}{rl} & 1 \\ 7 & \overline{)\,98} \\ & \underline{7} \\ & 2 \end{array}$$

4. **Bring down the**

   next number. → 8

$$\begin{array}{rl} & 1 \\ 7 & \overline{)\,98} \\ & \underline{7}\!\downarrow \\ & 28 \end{array}$$

These four steps must be repeated until there are no more numbers to bring down.

Repeat the four steps.

1. How many times will
   7 divide into 28 ⟶ 4

$$\begin{array}{r} 14 \\ 7\overline{)\;98} \\ \underline{7} \\ 28 \end{array}$$

2. Multiply
   4 x 7 = 28

$$\begin{array}{r} 14 \\ 7\overline{)\;98} \\ \underline{7} \\ 28 \\ 28 \end{array}$$

3. Subtract
   28 - 28 = 0

$$\begin{array}{r} 14 \\ 7\overline{)\;98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

4. There are no more numbers to bring down.

You need to save $14 a week to buy the table in seven weeks.

Reviewing Division Steps

Long division has four steps.

1. Divide ÷
2. Multiply x
3. Subtract −
4. Bring down the next number ↓

Practise doing long division. Use the four steps.

$6\overline{)\,90}$ $5\overline{)\,155}$ $4\overline{)\,168}$

Make sure that you are comfortable doing long division before you continue. If you are not, try working on practice exercises from other books.

The division problems on the last page ended up with a **remainder** of zero. This means the numbers divided evenly. Sometimes numbers do not divide evenly.

Try this problem.

You want to buy two chairs which cost $59 each or $118 altogether. You can save $9 a week. Figure out how long it will take to buy the chairs.

Use the four steps $\boxed{\div \quad \times \quad - \quad \downarrow}$

1. How many times will

   9 divide into 11 ⟶ 1

$$\begin{array}{r} 1 \\ 9\,\overline{)\,118} \end{array}$$

2. Multiply

   1 x 9 = 9

$$\begin{array}{r} 1 \\ 9\,\overline{)\,118} \\ 9 \end{array}$$

3. Subtract

   11 - 9 = 2

$$\begin{array}{r} 1 \\ 9\,\overline{)\,118} \\ \underline{9} \\ 2 \end{array}$$

4. Bring down the 8.

$$\begin{array}{r} 1 \\ 9\overline{)\,118} \\ \underline{9}\!\downarrow \\ 28 \end{array}$$

Repeat the four steps $\boxed{\div \quad x \quad - \quad \downarrow}$

1. How many times will
   9 divide into 28 ⟶ 3

$$\begin{array}{r} 13 \\ 9\overline{)\,118} \\ \underline{9} \\ 28 \end{array}$$

2. Multiply
   3 x 9 = 27

$$\begin{array}{r} 13 \\ 9\overline{)\,118} \\ \underline{9} \\ 28 \\ 27 \end{array}$$

3. Subtract

28 - 27 = 1

$$\begin{array}{r} 13 \\ 9\overline{)\,118} \\ \underline{9} \\ 28 \\ \underline{27} \\ 1 \end{array}$$

4. No more numbers to bring down.

It will take 13 weeks to save $118 to buy the two chairs.

A remainder of zero means that the numbers divided evenly and the answer is exact. Look at the remainder to the question above. There is a remainder of 1. Having a remainder that is not zero means that the numbers did not divide evenly. The answer is still as accurate as you can get.

A Variety of Problems

Before you solve any of these problems, read them and discuss what operation is needed to solve each one.

A 5-kilogram block of cheese costs \$30. What is the cost per kilo?

You work an 8-hour shift and it starts at 3:30. What time do you get off work ?

Here is a copy of a bill for some clothes. Is the total right? If not, change it.

$$\begin{array}{r} \$52 \\ \$16 \\ \$35 \\ \underline{\$49} \\ \$155 \end{array}$$

Before doing some grocery shopping, Betty had $60. Afterwards, she had $18. How much money did Betty spend?

Janusch wants to know how much he is going to earn in a week at his new job. He makes $8 an hour and he works 7 hours a day, 5 days a week. Find out how much he earns in a week.

Mira is 58 years old. She will retire when she is 65. In how many years will she retire?

You have $12 and you want to buy rice at $3 a bag. How many bags can you buy?

Sara is 43 years old. She has a 19–year–old son. How old was she when he was born?

A monthly magazine costs $2. A subscription costs $21 a year. Is it worth getting the subscription?

A book has 21 pages. George read 12 pages. How many pages are left to read?

Chantelle drove 15 kilometres to work, 4 kilometres to the dentist, and 8 kilometres home. How many kilometres did she drive?

Saima bicycled 80 kilometres in 8 hours. How far did she go in one hour?

Silvio spends $10 a week to get to work. How much does it cost to get to work in a year (52 weeks)?

Sandra bought a blouse for $19 at a sale. The price tag on the blouse said $45. How much did Sandra save?

Voula travels 8 kilometres a day on her bicycle to get to work. How many kilometres does she ride in a week and in a month?

Quan weighs 78 kilograms. Sam weighs 66 kilograms. How much heavier is Quan than Sam?

Rajesh earns $9 an hour. If he worked 35 hours last week, how much did he earn?

A room has 8 rows of chairs with 27 chairs in each row. How many chairs are in the room?

Rose and Avi took their 2 children to the movies. The price was $7 for adults and $4 for children. How much did it cost them to go to the movies?

At a speed of 3 kilometres per hour, how far can a person walk in 6 hours?

Jiten runs 7 kilometres every day, no matter what the weather. How many kilometres does he run in a month?

Imran is painting all the apartments in a building. Each apartment uses 5 litres of paint. There are 36 apartments in the building. How many litres of paint does he need?

Orit worked 5 days and earned $265. How much did she earn each day?

With a tutor or in a group, try making up problems and writing them down. Discuss how to solve them.

Solving Problems in your Life

The ability to use numbers is a skill that you can often use in your daily life. Here are some questions that may apply to you. Try solving them and think of other problems in your life that you want to solve.

Try to figure out which is cheaper for you, a metropass or tickets. You need to know three things: the price of the metropass, the number of times a month that you use the TTC, and the price of tickets.

If you get a paycheque, look at it to find out your total pay and your deductions, like taxes and Canada Pension Plan. On your cheque, you should be able to see your gross pay - what you earn - and your net pay - what you actually get.

Milk Milk
1 litre 1 litre
TOMATOES
796 ml

When you are in a grocery store, try to figure out whether a smaller package or a larger package is cheaper in the long run. You can compare the unit price. Unit price means the price per unit. Units can be in grams, millilitres, kilos, and so on.

Try to make a household budget. Write down how much money comes in to your household every week or month. Then write down your expenses – what you pay for rent, groceries, telephone, and so on.

Keep trying to work with numbers in your life!